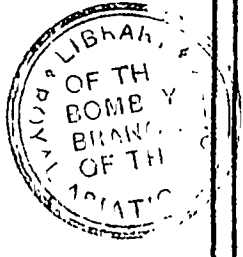
Public Works Department
Bombay Presidency

Irrigation Administration Report

Part I—Deccan and Gujarat

For the Year 1930-31



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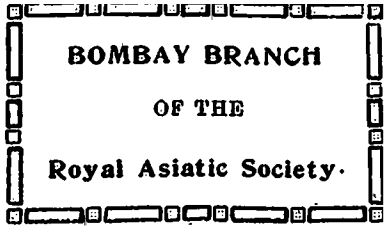

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DIAGRAM

SHOWING

EXPENDITURE ON IRRIGATION WORKS

IN THE PUBLIC WORKS DEPARTMENT

FROM

LOAN FUNDS, REVENUE & CONTRIBUTION

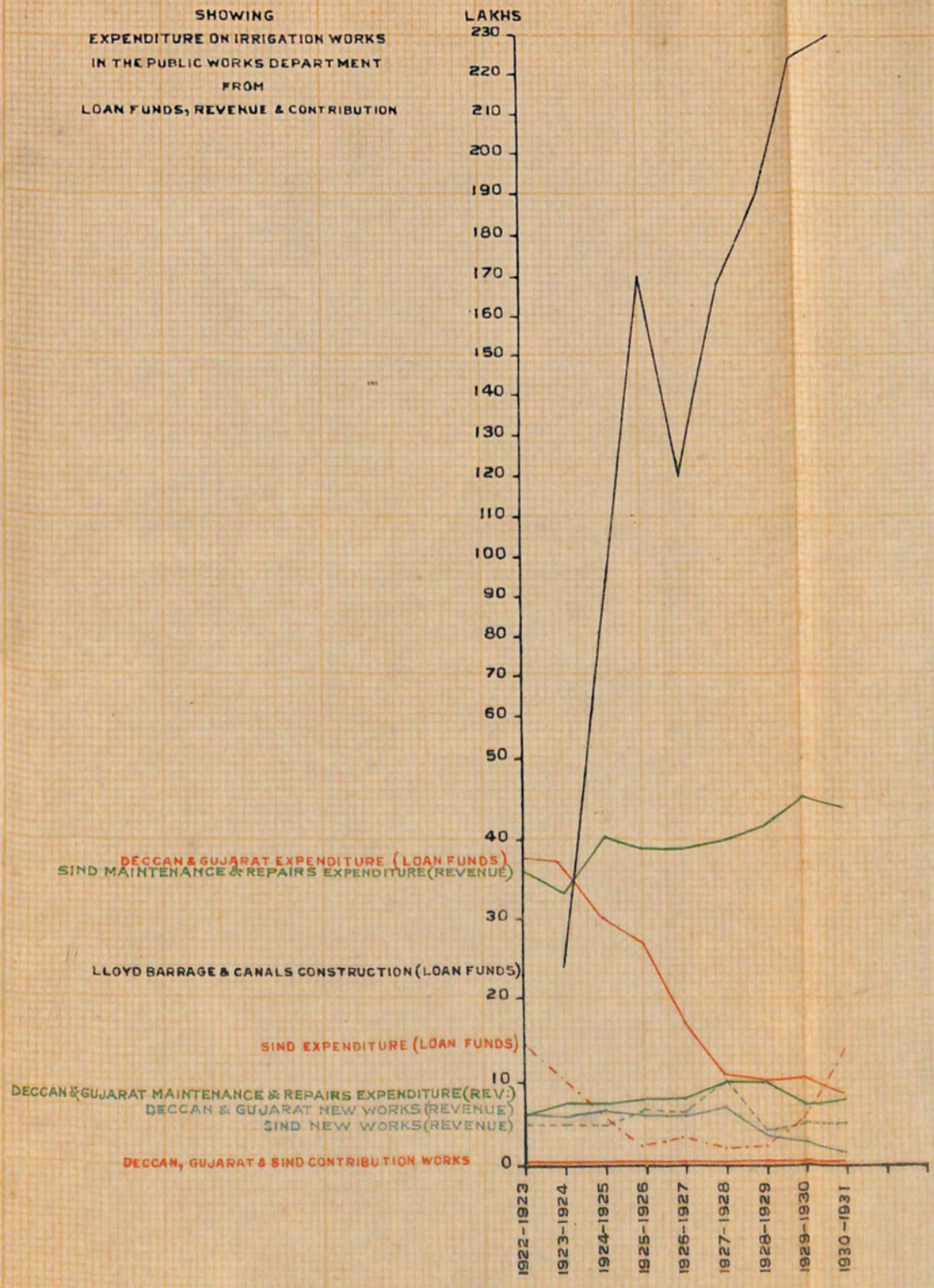

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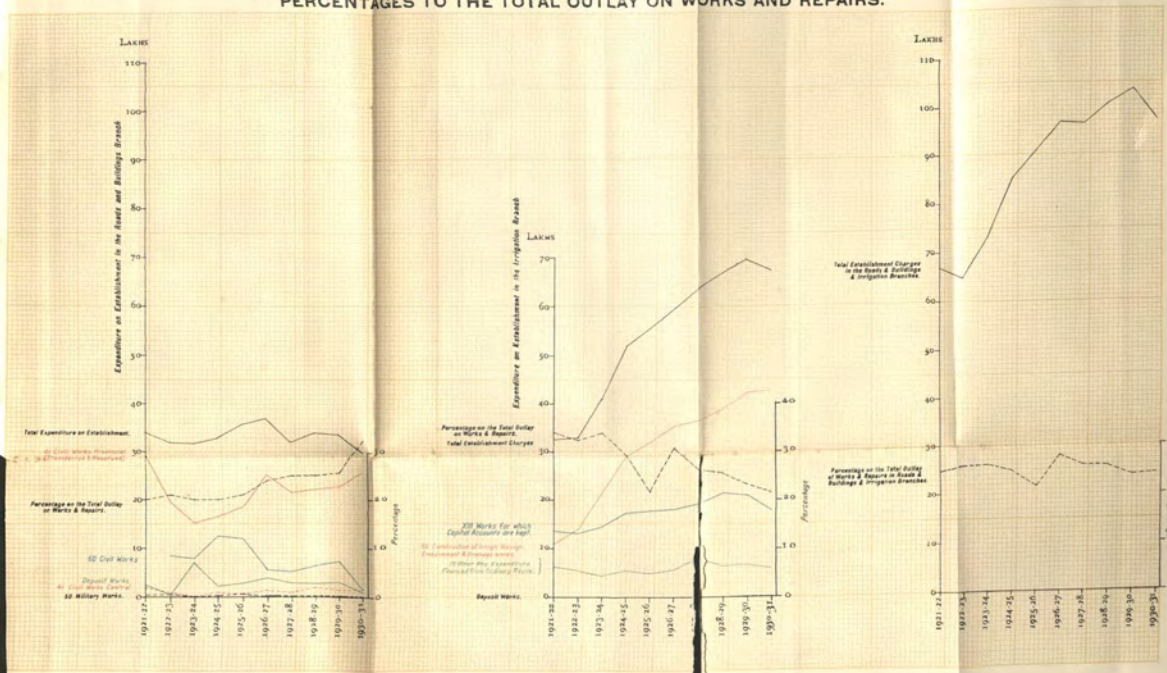
DIAGRAM SHOWING EXPENDITURE
ON ESTABLISHMENT
IN THE
ROADS & BUILDINGS & IRRIGATION BRANCHES
OF THE
PUBLIC WORKS DEPARTMENT
AND
PERCENTAGES TO THE TOTAL OUTLAY ON WORKS AND REPAIRS.



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Statement showing expenditure on establishment in the Roads and Buildings and the Irrigation Branches of the P. W. D. from the year 1921-22 to 1930-31 and percentage on the total outlay on works and repairs during that period in both the Branches.

Year.	Expenditure on Establishment in the Roads and Buildings Branch.							Expenditure on Establishment in the Irrigation Branch.
	41—Civil Works—Provincial (Transferred and Reserved).	60—Civil Works.	41—Civil Works—Central.	50—Military Works.	Deposit works.	Total establishment charges.	Percentage on the total outlay on works and repairs in the Roads and Buildings Branch.	55—Construction of Irrigation, Navigation, Embankment and Drainage Works.
1	2	3	4	5	6	7	8	9
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.
1921–22 ..	29,06,955	..	1,98,683	45,258	2,84,992	34,35,888	19·26	11,53,734
1922–23 ..	20,14,640	8,34,450	1,78,163	71,481	77,143	31,75,877	20·79	14,20,751
1923–24 ..	15,84,488	8,10,645	67,892	38,560	6,88,354	31,89,939	19·88	21,87,793
1924–25 ..	16,89,892	12,25,632	1,19,721	27,862	2,52,556	33,15,663	19·67	29,10,785
1925–26 ..	18,89,417	12,05,078	1,01,876	69,049	2,58,535	35,23,955	20·66	32,21,647
1926–27 ..	25,30,286	5,97,486	1,68,896	5,882	3,94,389	36,96,939	23·76	35,56,959
1927–28 ..	21,99,448	5,59,107	1,49,132	5,042	2,97,270	32,09,999	24·96	36,98,956
1928–29 ..	22,40,393	6,56,713	2,29,540	2,240	2,56,180	33,85,066	25·03	39,04,670
1929–30 ..	22,45,450	7,33,867	1,56,773	3,638	2,34,897	33,74,625	25·26	42,26,873
1930–31 ..	25,51,711	1,80,139	1,72,163	2,415	85,444	29,91,872	32·35	42,88,966

Year.	Expenditure on Establishment in the Irrigation Branch.					Total Establishment charges in the Roads and Buildings and Irrigation Branches.	Percentage on the total outlay of works and repairs in Roads and Buildings and Irrigation Branches.
	XIII—Works for which capital accounts are kept.	15—Other Revenue Expenditure financed from Ordinary Revenues.	Deposit Works.	Total establishment charges.	Percentage on the total outlay on works and repairs in the Irrigation Branch.		
1	10	11	12	13	14	15	16
	Rs.	Rs.	Rs.	Rs.		Rs.	
1921–22 ..	13,85,960	6,68,651	2,770	32,11,115	33·59	66,47,003	24·26
1922–23 ..	13,44,901	5,34,327	1,993	33,01,972	32·22	64,77,849	25·38
1923–24 ..	14,43,222	4,32,013	2,056	40,65,084	33·89	72,55,023	25·87
1924–25 ..	17,37,724	5,26,361	492	51,75,362	28·73	84,91,025	24·35
1925–26 ..	17,99,343	5,19,228	2,681	55,42,899	21·62	90,66,854	21·23
1926–27 ..	18,08,385	5,94,989	3,207	59,63,540	30·56	96,60,479	27·54
1927–28 ..	19,20,773	7,80,312	3,847	64,03,888	26·00	96,13,887	25·64
1928–29 ..	21,35,939	6,16,601	2,750	66,59,960	25·51	1,00,45,026	25·35
1929–30	21,08,302	6,18,312	1,012	69,54,499	23·26	1,03,29,124	23·88
1930–31 ..	18,31,149	5,99,621	1,734	67,21,470	21·60	97,13,342	24·06

Note.—The percentage of the establishment charges on the cost of works and repairs in the Irrigation Branch (column 14) is generally higher than that in the Roads and Buildings Branch (column 8). The reason is largely that the establishment charges in the Irrigation Branch include the cost of Special Revenue Establishment employed entirely on "revenue management" work on certain canal systems in Sind and the Deccan which has no connection with the execution of works and repairs, and that these charges also include cost of part of the time of Irrigation establishment spent on revenue management including the *control and distribution of water*, which is debited in the accounts to "revenue management" and not to execution of works and repairs. If these establishment charges debited in the accounts to "revenue management" are deducted from the total cost of establishment in the Irrigation Branch the percentage on the cost of works and repairs will not be so divergent. The increase in the rate per cent. in the R. & B. Branch in 1930-31 as compared with that for 1929-30 is mainly due to decrease in outlay on "works" and "repairs". Establishment charges cannot be reduced in the same ratio in which expenditure on works is reduced. A mere overall percentage on expenditure on works is inaccurate. The question of devising a more accurate formula to measure establishment charges is under consideration.

IRRIGATION ADMINISTRATION REPORT
PART I—DECCAN AND GUJARAT
1930-31

PHYSICAL FEATURES—GENERAL DESCRIPTION OF IRRIGATION.

Irrigation in the Deccan and Gujarat differs materially from that in Sind. Rainfall is available for agricultural operations but is often precarious. Tanks and canals provide irrigation to valuable crops such as sugarcane and are a source of supply to other crops also when the rainfall is deficient or irregular. The old irrigation works consist chiefly of a few small canals and moderately large tanks, some 12,000 smaller tanks mostly in the southern part and in Gujarat, and of about 400 bandharas in Nasik and Khandesh Districts. The tanks have earthen dams and the larger ones irrigate areas up to 1,300 acres, and the smaller ones up to 500 acres, situated immediately below and in the vicinity of the dams. The chief crop irrigated is rice. The bandharas are masonry weirs built across rivers to head up the water to a level sufficient to irrigate lands on the banks of the streams by means of channels taking off from the flanks of the bandharas. The areas irrigated are up to 800 acres and the chief crops are sugarcane, wheat, bajri and gram. From these small beginnings have evolved the magnificent irrigation works which now form such a conspicuous feature in the Deccan and have so successfully fulfilled their beneficent purpose in banishing the famines which formerly devastated this portion of the Province.

2. The irrigation works in the Deccan are fundamentally different from those in Sind, the Punjab, Egypt or Mesopotamia, where wide alluvial plains have been formed by great deltaic rivers in perennial flow. The Bombay Deccan consists of a sloping table-land running eastward from the ridge of the great geographical feature of Western India—the Western Ghats. These form a ridge running parallel to the sea-coast at a distance of 50 to 100 miles from it; precipitous on the western side, they fall away more gradually to the east. The heaviest rainfall occurs on the peak of the Ghat ridge, where anything up to 270 inches or more of rain are recorded in the four monsoon months. The intensity of the rainfall rapidly decreases as we go eastward from the highest ridge, reaching a figure of 20 or 25 inches at a distance of 100 or 150 miles east of the Ghats. The rivers in the Deccan rise in the valleys close to the ridge, flow in an eastward direction, and are dry or practically so for 7 or 8 months of the year. The line of the Ghats, like the ridge of a roof, divides the rainfall into two parts; the smaller portion falls westward into the Indian Ocean, and the larger flows through long lengths of tortuous rivers to the east and joins the rivers which reach the

sea on the south-eastern coast of the peninsula. These rivers are in flow during the monsoon months only, and if no artificial means of conserving their waters were provided, the whole monsoon rainfall would be wasted so far as the Bombay Deccan is concerned, and would simply flow away to the sea, benefiting but to a small extent the country traversed.

3. The large irrigation systems in the Deccan are all of the same type. Each depends upon a storage lake near the head of one of the river valleys, where sufficient water is collected during the monsoon to supply the country on either side of the river valley below. The water stored during the rains is let out during the dry months of the year in accordance with requirements ; and at a point on the river, which may be as far as 50 miles from the main storage lake, a 'pick-up-weir' is constructed across the river-course to divert the water into canals taking off on either side of the weir. In one case only, that of Lake Fife at Khadakwasla near Poona, do the canals take off from the flanks of the dam itself. The canals are always constructed at a considerably flatter slope than that of the river, and consequently are able to diverge from the river itself on each side of the valley ; as a rule each canal only irrigates the area between itself and the river.

SECTION I.

COMPRISING IRRIGATION WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.

GENERAL REMARKS.

Works in operation.

4. The following list includes all the works in operation (43 in number) :—

Serial Number.	Name of Work.	Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec.	Whether supply is reliable or dependent on local rain.	Whether storage works completed or proposed.	Remarks.
		Acres			
1	Hathmati and Khari Cut Canals.	24,000	Dependent on local rain.	No storage work. Bokh reservoir, Chandola tank and Wasai reservoir completed.	The catchment of the Hathmati river is hilly, covered partly with forest and that of Khari is undulating ground at its source and then plain ground with cultivated fields. Supply depends upon the flow in the rivers, and the contents of the Bokh reservoir, Chandola tank and Wasai reservoir.
2	Wangroli Tank ..	3,400	Do. ..	Completed ..	The catchment is ordinary plain ground and cultivated fields.
3	Savli Tank ..	3,000	Do. ..	Do. ..	Ordinary catchment on undulating ground.
4	Saiat Tank ..	2,000	Do. ..	Do. ..	Ordinary catchment on flat ground.
5	Tranza Nagrama Tanks.	800	Do. ..	Do. ..	The Tranza tank has no independent catchment. The Nagrama has a catchment of 1·5 sq. miles. Both are fed by the Matar drainage channel which is not reliable as it seldom flows.
6	Futelao Tank ..	800	Do. ..	Do. ..	Hilly catchment.
7	Nira Left Bank Canal including Shetphal Tank.	100,000	Reliable ..	Lake Whiting (Lloyd Dam) completed.	Ghat catchment.
8	Nira Right Bank Canal.	180,000	Do. ..	Do. ..	Do.
9	Mhaswad Tank ..	14,000	Dependent on local rain.	Completed ..	Deccan catchment.
10	Mutha Canals including Matoba Tank.	49,000	Reliable ..	Lake Fife completed.	Ghat catchment.
11	Kasurdi Tank ..	40	Dependent on local rain.	Completed ..	Deccan catchment.
12	Shirsuphal Tank ..	1,150	Do. ..	Do. ..	Do.
13	Bhadalvadi Tank ..	1,225	Do. ..	Do. ..	Do.

Serial Number.	Name of Work.	Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec.	Whether supply is reliable or dependent on local rain.	Whether storage works completed or proposed.	Remarks.
		Acres			
14	Godavari Right Bank Canal. Godavari Left Bank Canal.	44,000 26,000	Reliable ..	Lake Beale completed.	Ghat catchment.
15	Girna Left Bank Canal.	9,000	Do. ..	Chankapur Tank completed.	Do.
16	Kadwa River Works. Palkhed Canal. Ojhar Tambat Canal. Wadali Canal.	7,680	Do. ..	Waghad Tank completed.	Do.
17	Parsul Tank ..	1,440	Dependent on local rain.	Completed ..	Deccan catchment.
18	Pravara Right Bank Canal. Pravara Left Bank Canal.	18,480 64,080	Reliable ..	Lake Arthur Hill (Wilson Dam) completed.	Ghat catchment.
19	Bhatodi Tank ..	1,461	Dependent on local rain.	Completed ..	Deccan catchment.
20	Ekruk Tank ..	13,070	Do. ..	Do. ..	Do.
21	Koregaon Tank ..	416	Do. ..	Do. ..	Hilly catchment.
22	Ashti Tank ..	3,382	Do. ..	Do. ..	Deccan catchment.
23	Pathri Tank ..	3,094	Do. ..	Do. ..	Hilly catchment.
24	Jamda Canals ..	42,000	Girna river supply not reliable.	Water is issued from the Chankapur Tank when available.	Ghat catchment for a small part and for the rest Deccan catchment.
25	Hartala Tank ..	978	Dependent on local rain.	Completed ..	Deccan catchment.
26	Mhaswa Tank ..	3,256	Do. ..	Do. ..	Do.
27	Shahada Channel ..	2,000	Reliable ..	No storage work ..	Hilly catchment. Supply is perennial.
28	Lower Panjhra River Works.	8,173	Panjhra river supply not reliable.	Mukti Tank completed.	Ghat catchment for one part and Deccan catchment for the rest.
29	Krishna Canal	6,412	Reliable ..	Proposed ..	Ghat catchment.
30	Rewari Canal ..	439	Dependent on local rain.	No storage work ..	Deccan catchment.
31	Upper Man River Works.	373	Do. ..	Pingli Tank completed.	Do.
32	Yerla River Irrigation Works.	1,182	Do. ..	Nehr Tank completed.	Do.
33	Chikhli Canal ..	358	Do. ..	No storage work.	Do.

Serial Number.	Name of Work.	Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec.	Whether supply is reliable or dependent on local rain.	Whether storage works completed or proposed.	Remarks.
		Acres.			
34	Maini Tank ..	455	Dependent on local rain.	Completed ..	Deccan catchment.
35	Gadikeri Tank ..	416	Do. ..	Do. ..	Do.
36	Gokak Canal ..	17,627	Reliable ..	Do. ..	Ghat catchment.
37	Muchkundi Tank ..	750	Dependent on local rain.	Do. ..	Deccan catchment.
38	Dambal Tank ..	531	Do. ..	Do. ..	Do.
39	Medleri Tank ..	231	Do. ..	Do. ..	Do.
40	Madag Tank ..	1,418	Do. ..	Do. ..	Ghat and Forest catchment.
41	Asundi Tank ..	303	Do. ..	Do.	Deccan catchment.
42	Dharma Canal ..	For monsoon season 6,580 acres. For rabi nil.	Do. ..	No storage work. The canal takes off from the river itself.	Forest catchment.
43	Mavinkop Tank ..	617	Do. ..	Completed ..	Do.

Ekruk tank, Gadikeri tank, Mavinkop tank and Shahada channel are the only productive works and the rest are unproductive.

5. The interest account for the year stands as follows :—

	Productive Works.	Unproductive Works.	Total.
	Rs.	Rs.	Rs.
Total interest charges during 1930-31 ..	46,556	41,03,149	41,49,705
Net revenue realised during 1930-31 ..	1,57,148	9,25,839	10,82,987

Net loss, i.e. difference between interest and net revenue—Rs. 30,66,718.

6. The gross revenue realised from all sources during the year, after deducting refunds of revenue (Rs. 11,635), amounted to Rs. 27,03,446 of which Rs. 26,79,636 were direct and Rs. 23,810 indirect receipts. The net revenue realised after deducting working expenses amounted to Rs. 10,82,987. The gross revenue and the net revenue show a decrease of Rs. 3,25,906 and Rs. 2,32,931, respectively, as compared with the figures of the previous year.

7. The gross area under command was 1,799,000 acres. The area irrigable at present is 623,000 acres.

8. The financial results of the year by main heads were as under :—

	Area irrigated.	Revenue realised.			Working expenses.	Net revenue.
		Direct receipts.	Share of land revenue.	Total.		
	Acres	Rs.	Rs.	Rs.	Rs.	Rs.
Productive	6,351	1,70,534	9,754	1,80,288	23,140	1,57,148
Unproductive	222,354	25,09,102	14,056	25,23,158	15,97,319	9,25,839
Total ..	*228,705	26,79,636	23,810	27,03,446	16,20,459	10,82,987

*Inclusive of 8,610 acres under consolidated assessment.

Area irrigated, revenue, etc.

9. The figures of area irrigated, revenue assessed and realised and working expenses, as compared with those of the previous three years are given below :—

Year.	Area irrigated†.	Revenue.		Working expenses.
		Assessment.	Realisations.	
	Acres	Rs.	Rs.	Rs.
1927-28	248,222	35,11,724	36,63,481	16,01,445
1928-29	231,544	31,59,294	32,97,763	17,99,486
1929-30	246,036	31,63,392	30,29,352	17,13,434
Average ..	241,934	32,78,137	33,30,199	17,04,788
1930-31	228,705	27,67,176	27,03,446	16,20,459

†Inclusive of the area under consolidated water and land assessment.

10. The state of Revenue collections was as follows :—

		Rs.
Balance of demands unrealised at the commencement of the year		16,83,184
Demands of the year :—	Rs.	
Rabi, 1929-30 ..	7,27,272	
Kharif, 1930-31 ..	20,63,625	
Miscellaneous receipts ..	4,21,356	
		32,12,253
Total ..		48,95,437
Deduct—		
Remissions		8,189
Net Total ..		48,87,248
Amount unrealised at the close of the year ..		21,95,977

	Rs.	Rs.
Actual receipts of the year ..	26,91,271	
Add—		
Share of land revenue ..	23,810	
Deduct—		27,15,081
Refunds of revenue ..	..	11,635
Revenue realised ..	..	27,03,446

The remissions and refunds together amounted to Rs. 19,824. The amount unrealised at the close of the year amounted to Rs. 21,95,977 which is made up as follows :—

	Rs.
Hathmati and Khari Cut Canals	1,31,039
Krishna Canal	61,897
Ashti Tank	31,593
Mutha Canals and Matoba Tank	2,23,049
Gokak Canal	56,153
Mhaswad Tank	40,055
Nira Left Bank Canal and Shetphal Tank ..	5,53,457
Kadwa River Works	36,764
Savli Tank	10,717
Chankapur Tank—Girna Left Bank Canal ..	55,277
Godavari Canals	3,76,571
Nira Right Bank Canal	2,02,203
Pravara River Works	3,59,529
Other works	57,673
Total ..	21,95,977

Part of this amount has already been recovered since the close of the year and steps have been taken to recover the balance.

Working expenses.

11. The working expenses of the year amounted to Rs. 16,20,459 against Rs. 17,13,434 of the previous year. The following table compares the charges under the principal heads with those of the previous three years :—

	1927-28.	1928-29.	1929-30.	1930-31.
	Rs.	Rs.	Rs.	Rs.
Works	65,471	34,267	36,036	43,302
Repairs	6,09,152	5,64,625	5,22,663	5,24,613
Establishment	10,25,925	10,76,789	10,72,593	9,79,960
Tools and Plant	19,836	18,383	13,053	9,799
Total in the Public Works Department ..	17,20,384	16,94,064	16,44,345	15,57,674
Collection charges	—1,25,695	99,420	63,402	57,111
Indirect charges	6,756	6,002	5,687	5,674
Total working expenses ..	16,01,445	17,99,486	17,13,434	16,20,459

Details of working expenses.

12. The following table gives the details of working expenses for some of the principal works :—

Name of work.	Average incidence of water rate per acre.	Cost of measurement.		Working expenses in the P. W. Department.	
		Total cost.	Per acre.	Per mile of main canal.	Per acre irrigated.
	Rs.	Rs.	Rs. a. p.	Rs.	Rs.
Nira Left Bank Canal and Shetphal Tank	11·86	1,812	0 0 7	3,647	5·91
Pravara Canals	14·49	971	0 0 6	2,231	8·76
Girna Left Bank Canal	7·1	485	0 1 5	4,547	15·44
Godavari Canals	15·56	410	0 0 8	1,799	9·4
Mutha Canals and Matoba Tank ..	14·67	1,185	0 1 3	1,146	6·83
Kadwa River Works	12·37	301	0 1 6	1,127	8·46
Mhaswad Tank	5·29	74	0 0 4	..	6·19
Nira Right Bank Canal	5·66	1,076	0 0 11	1,548	13·33
Krishna Canal	14·75	800	0 2 7	600	4·39
Yerla River Irrigation Works ..	2·67	520	0 2 6	486	4·97
Upper Man River Works ..	2·46	150	0 2 5	533	9·61
Jamda Canals	3·9	146	0 1 5	384	9·33
Ekruk Tank	3·18	642	0 2 7	381	4·57
Ashti Tank	3·1	185	0 0 9	434	2·97
Maini Tank	2·14	315	0 2 2	677	2·67
Gokak Canal	7·0	1,667	0 3 0	367	2·18
Dharma Canal	5·79	257	0 9 1	46	0·22

13. The gross assessed revenue, direct and indirect, amounted to Rs. 27,67,176 against Rs. 31,63,392 of the previous year. The details of the gross assessment are as under :—

Gross assessed revenue.

	Direct revenue.			Indirect revenue.	Total.
	Water rates.	Other receipts.	Total.		
	Rs.	Rs.	Rs.	Rs.	Rs.
Productive	16,261	1,37,280	1,53,541	9,754	1,63,295
Unproductive	23,05,749	2,84,076	25,89,825	14,056	26,03,881
Total ..	23,22,010	4,21,356	27,43,366	23,810	27,67,176

14. The net assessed revenue of the year, after deducting working expenses (Rs. 16,20,459), amounted to Rs. 11,46,717 against Rs. 14,49,958 of the previous year.

15. The following table gives the percentage return earned during the year on capital outlay on the principal works in operation :—

Name of work.	Total capital outlay (direct and indirect).	Gross receipts (direct and indirect).	Working expenses (direct and indirect).	Net revenue.	Percentage return on capital outlay (column 2).
	Rs.	Rs.	Rs.	Rs.	Rs.
Hathmati and Khari Cut Canals ..	13,18,729	11,058	38,546	—27,488	..
Nira Left Bank Canal and Shetphal Tank.	1,30,66,444*	6,82,485	4,03,926	2,78,559	2·13
Nira Right Bank Canal ..	3,94,73,905	1,07,597	2,51,915	—1,44,318	..
Mhaswad Tank	20,96,016	38,975	22,019	16,956	0·81
Mutha Canals and Matoba Tank ..	66,45,857	4,03,954	1,00,816	3,03,138	4·56
Godavari Canals	1,03,51,156	3,35,383	2,19,478	1,15,905	1·12
Chankapur Tank—Girna Left Bank Canal.	20,56,431	17,977	84,619	—66,642	..
Kadwa River Works	10,35,876	34,654	27,178	7,476	0·72
Pravara River Works	1,50,07,048	5,59,437	2,56,887	3,02,550	2·02
Ekruk Tank	13,40,386	1,66,452	18,176	1,48,276	11·06
Lower Panjhra River Works ..	4,68,621	26,311	4,198	22,113	4·71
Krishna Canal	9,49,807	80,760	21,153	59,607	6·27
Gokak Canal, 1st Section and Storage Works.	14,66,673	84,911	43,278	41,633	2·84

*Inclusive of proportionate expenditure on the old Bhatgar Dam and the new Lloyd Dam.

16. The average water rates per acre of land actually irrigated were :—

	Rs.
Productive works	3·58
Unproductive works	10·70

17. The water rate assessments and other receipts compare with those of the previous year as under :—

	1929-30.	1930-31.
	Rs.	Rs.
Water rates	27,38,194	23,22,010
Other receipts—		
Plantations	16,705	8,579
Water power	14,313	14,313
Miscellaneous	3,73,168	3,98,464
Total ..	4,04,186	4,21,356
Share of land revenue ..	21,012	23,810
Grand Total ..	31,63,392	27,67,176

18. The principal crop acreages irrigated during 1929-30 and 1930-31 are given below :—

Crop acreages.

	1929-30. Acres	1930-31. Acres
Gardens and orchards ..	5,247	4,951
Sugarcane	31,314	30,102
Wheat	14,374	11,461
Rice	7,840	16,947
Maize	3,977	2,952
Jowar	68,231	48,957
Bajri, etc.	16,033	17,302
Gram, etc.	8,309	17,398
Groundnut	13,590	12,151
Condiments	4,831	6,038
Cotton	19,361	11,242
Fodder crops	5,360	7,478

The total estimated value of crops was Rs. 140·46 lakhs against Rs. 244·47 lakhs of the previous year.

DETAILED REPORTS BY LOCAL OFFICERS.

NORTHERN CIRCLE.

19. The monsoon broke at the normal time and ended by the middle of September. The rainfall during the year was fairly good but was not well distributed, being deficient in the latter part of the season. The demand for irrigation was keen and some difficulty was experienced in distributing water to all the area under cultivation. A fairly good area was however irrigated and brought to maturity. The rainfall gauged at Ahmedabad and Prantij was 32·56 and 22·2 inches respectively as compared with 45·14 and 34·09 inches, the average of the last three years. At Bareja, a central place of irrigation on the Khari Cut Canal, the rainfall was 26 inches against 37·17 inches, the average of the last three years and at Himatnagar, the head-works of the Hathmati Canal, it was 28·25 inches against 33·29 inches, the average of the previous three years.

20. The irrigation works in operation in this Circle are (1) the Hathmati and the Khari Cut Canals, (2) Wangroli Tank, (3) Tranza Nagrama Tanks, (4) Savli Tank, (5) Saiat Tank and (6) Futelao Tank. No. (1) is a work without storage and depends solely on rainfall. The works are financially unproductive as the revenue derived therefrom is in most years insufficient to cover their working expenses.

AHMEDABAD AND KAIRA AND PANCH MAHALS DIVISIONS.

Hathmati and Khari Cut Canals.

21. This system is the most important canal system in Gujarat. The Hathmati Canal is so designed that in addition to irrigating the area directly depending on it, it can, when surplus water is available, pass

part of its supply into the Bokh reservoir and part into the Khari river. The Bokh reservoir has no direct irrigation under it but acts as a storage work for the Khari into which it discharges. Lower down on the Khari are two small irrigation systems which utilise the natural flow of the river and also the surplus water made available from the Hathmati Canal, part of the supply being abstracted for direct irrigation at the so-called 'Khari Sluices' and part diverted through an artificial cut, the Khari Cut, into a natural channel, running down the centre of the Sabarmati Khari plain and supplying a system of distributaries, several small tanks and the large Chandola tank near Ahmedabad. This system was first opened in 1873-74 and has cost more than Rs. 13 lakhs.

22. The Hathmati river was first in flood during the year on 4th July and the depth of flow over the weir which was 1·5 feet lasted for two days. There were three subsequent floods in the river on the 11th and 19th July and 9th August, the first lasting for three days and the other two for 10 and 8 days each. The greatest height of water over the weir crest was 2·95 feet on the 9th August, when the discharge was 21,144 cusecs. The area irrigated under the Hathmati Canal was 1,039 acres of rice crop in the Kharif season and 1,147 acres in the Rabi season. Out of 177 cusecs of the average daily discharge admitted into the canal at its head during the Kharif season, 102 cusecs were made available for the Khari Cut Canal. The flow delivered into the Bhojwa channel from 6th July to 20th September amounted to 686 million cubic feet. The Bokh reservoir received surplus flow of the Hathmati Canal from 5th July to 8th October, and the total flow delivered into the reservoir amounted to 682 million cubic feet, against the storage capacity of 320 million cubic feet. The reservoir filled to the full supply level on 26th August and water was let down into the Khari river from 31st July for irrigation on the Khari Cut Canal.

23. The area irrigated under the Khari Cut Canal was 8,791 acres in the Kharif season. In the Rabi season only 4 acres were irrigated by lift from the tanks fed by the canal. The Khari was in flood on 21st June and the discharge measuring 224 cusecs lasted for 3 days. On 6th July, there was another flood and the flow increased to 487 cusecs for a day only. On 22nd July the river rose again to the highest level recorded during the year with a discharge of 1,398 cusecs which lasted for two days. The last flood occurred on 6th August with a discharge of 464 cusecs, giving a fairly good flow for about a week. After meeting the demand of the Kalambandhi area on the Khari Sluices, no surplus water was left in the river to be passed into the Khari Cut Canal. The Khari Cut Canal was opened on 24th July for receiving the surplus water of the Hathmati river and was closed on 11th October, when the Bokh reservoir was empty. The tanks under the Khari Cut Canal system did not get any replenishment from the inadequate rainfall in their catchments. They had therefore to be filled with canal water and were all full by the middle of August. The total rice area transplanted on rain-water under the Khari Cut Canal was about 12,000 acres. The duty obtained in the Kharif season on the Khari Cut Canal with an average discharge of 78 cusecs was 113 acres per cusec. There was no flow in the canal in the Rabi season.

24. The area irrigated, the irrigation assessment, etc. on the Hathmati and Khari Cut Canals, as compared with the average of the preceding three years, are given below :—

—	Kharif.		Rabi.		Total.		Average water rate per acre.	Working expenses.
	Area irrigated.	Assessment.	Area irrigated.	Assessment.	Area irrigated.	Assessment.		
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Rs.	Rs.
Average	9,231	55,823	2,903	7,944	12,134	63,767	4·86	*47,738
1930-31	9,954	38,191	1,151	3,373	11,105	41,564	3·74	38,546

25. Besides the remissions of Rs. 2,617 from the Himayat (i.e. the irrigation share of consolidated assessment) remissions amounting to Rs. 14,214 from the irrigation assessment were granted during the year on account of failure of crops in both the Kharif and Rabi seasons owing to deficient supply of irrigation water. The gross revenue realised from all sources amounted to Rs. 11,041 and was less than the working expenses by Rs. 27,505, involving a loss of 2 per cent. on the total capital outlay exclusive of interest. If the interest charges during the year, amounting to Rs. 41,409, are taken into account the result is a loss of 5·2 per cent. on the capital cost of the Hathmati and Khari Cut Canals combined. The large sum of Rs. 1,31,039 remained unrealised at the end of the year.

First Class Irrigation Tanks in Gujarat.

26. The five first class tanks mentioned below were constructed between the years 1904 and 1917 at an aggregate cost of Rs. 11 lakhs. They rarely yield any net return as there is not much demand on them in years of good rainfall, while in years of scarcity the tanks themselves have deficient supplies. The Futelao tank is in the Panch Mahals Collectorate, while the rest are in the Kaira Collectorate. The area irrigated, assessment and the working expenses on the tanks during the year compare with the average of the previous three years as under :—

Name of tank.	Year	Kharif.		Rabi.		Total.		Working expenses.
1		2	3	4	5	6	7	8
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Rs.
Wangroli ..	Average ..	1,075	5,236	168	669	1,243	5,905	7,268
	1930-31 ..	1,762	8,788	189	829	1,951	9,617	7,747
Savli	Average ..	1,366	5,595	..	..	1,366	5,595	7,236
	1930-31 ..	2,216	11,504	..	..	2,216	11,504	6,513
Saiat	Average ..	473	1,726	68	281	541	2,000	8,265
	1930-31 ..	915	3,641	56	226	971	3,867	4,778
Tranza Nagrama ..	Average ..	40	153	13	45	52	197	2,990
	1930-31 ..	..	..	..	..	..	..	2,217
Futelao	Average ..	13	100	82	247	95	348	2,246
	1930-31 ..	..	..	86	295	86	295	1,455

27. The percentage returns from the working of these tanks during the year were as under :—

Name of tank.	Gross assessment.	Gross realisations.	Less working expenses.	Balance net revenue	Capital outlay direct and indirect to end of 1930-31.	Percentage return.
	Rs.	Rs.	Rs.	Rs.	Rs.	
Wangroli	10,771	7,672	7,747	— 75	2,93,295	— ·02
Savli	13,007	6,983	6,513	470	2,55,210	·18
Saiat	4,805	4,582	4,778	— 196	1,84,029	— ·1
Tranza Nagrama ..	85	88	2,217	—2,129	2,80,635	— ·75
Futelao	364	108	1,455	—1,347	1,16,461	—1·15

Wangroli Tank.

28. The tank filled to its full supply level and the water was utilised for irrigating both Kharif and Rabi crops, mainly rice, wheat and gram. The miscellaneous revenue during the year amounted to Rs. 1,154 against Rs. 1,316 of the previous year. The decrease in revenue was due to less tank bed cultivation. The rainfall gauged at the site of the tank wes 41·27 inches against 39·51 inches, the average of the previous three years.

Savli Tank.

29. The tank filled to the full supply level and the replenishment was utilised for irrigating Kharif crops, mainly rice. The demand for water in the Kharif season was heavy owing to unfavourable rains and no water was left over for Rabi irrigation. The miscellaneous revenue realised during the year was Rs. 1,503 against Rs. 1,531 of the previous year. The rainfall gauged at the tank site was 36·14 inches against 39·48 inches, the average of the previous three years.

Saiat Tank.

30. The tank filled to its full supply level and the water was utilised for irrigating both the Kharif and Rabi crops, mainly rice, gram, tur, etc. The miscellaneous revenue realised during the year amounted to Rs. 938 against Rs. 1,099 of the previous year. The decrease was due to less amount received for grazing on the tank. The rainfall gauged at the site of the tank was 43·06 inches against 47·9 inches, the average of the past three years.

Tranza Nagrama Tanks.

31. The tanks did not fill during the year and there was no irrigation under them. The miscellaneous revenue realised amounted to Rs. 85 against Rs. 1,446 of the previous year. The rainfall gauged at Nagrama was 26·33 inches and it was about the same at the Tranza tank, the average rainfall for the past three years being 44·39 inches.

Futelao Tank.

32. The tank filled to its full supply level but there was no irrigation in the Kharif season due to good local rainfall and the supply was utilised for Rabi irrigation. The miscellaneous revenue realised was Rs. 69 against Rs. 33 of the previous year. The rainfall gauged during the year was 36·58 inches against 29·01 inches, the average of the past 3 years.

IRRIGATION DEVELOPMENT AND RESEARCH CIRCLE.

33. Up to the end of the year 1927 the areas served by the rivers Nira, Godavari, Mutha, Pravara and Kadwa were grouped together under one Circle of superintendence called the Deccan Irrigation Circle. The work in this Circle had been for some time past much heavier than could be properly handled by one officer. Moreover, irrigation in the Deccan had reached a critical stage and its advance depended upon a satisfactory solution of the many difficult and complex problems which arise from time to time. In order to deal adequately with the scientific side of irrigational problems and practice a new Circle of superintendence, called the Irrigation Development and Research Circle, was accordingly created on 1st December 1927, and the Nira Left Bank Canal and Special Irrigation Divisions were placed under it. The work done by the latter Division is described under section III of this Report.

NIRA LEFT BANK CANAL DIVISION.

Nira Left Bank Canal and Shetphal Tank.

34. This canal which came into operation in 1885-86 is one of the pioneer irrigation works in the Deccan and protects a tract with a very precarious rainfall in the Poona District. The original scheme consisted of (*a*) a ghat-fed storage tank at Bhatgar (Lake Whiting) about 32 miles south of Poona on the Yelwandi river impounding 5,300 million cubic feet of water, (*b*) a pick-up weir at Vir on the Nira river about 17 miles downstream from Bhatgar, (*c*) a canal about 100 miles long, irrigating about 80,000 acres annually, and (*d*) a tank at the tail of the canal with an effective capacity of 592 million cubic feet used for storing a portion of the surplus monsoon discharge. The original masonry dam 127 feet high is now replaced by the higher Lloyd Dam referred to in paragraph 44 later on. The canal commands a gross area of 201,000 acres while the area commanded by the Shetphal Tank is 23,500 acres. The canal had originally a capacity of 456 cusecs and is now being remodelled to carry a discharge of 720 cusecs. The scheme is the most remunerative of the larger protective irrigation works in the Deccan.

35. The rainfall at Bhatgar during the year was 50·88 inches while the average rainfall along the canal was 18·79 inches. Though the rainfall of the year was below the average it was on the whole satisfactory, due to timely showers in the rabi season. The supply of water was sufficient for requirements and was given for early sowing of cotton and groundnut. It was possible to meet all demands for water on the canal. During the latter part of the year there was a sudden fall in the prices of all commodities. This economic depression was keenly felt on the canal where intensive cultivation is being practised. The level of water in the Shetphal

Tank reached its lowest depth of 18·3 feet on 13th June, the contents then being 114·56 million cubic feet. Replenishment from the canal commenced on 13th June and the water in the tank reached the highest level of 36·95 feet on 16th August, the corresponding contents being 571·65 million cubic feet.

36. The following table gives the results of irrigation, revenue, etc., during the year as compared with the average of the previous three years.

Area irrigated.		Irrigation assessment.		Gross assessment.		Rainfall.	
1930-31	Average.	1930-31	Average.	1930-31.	Average.	1930-31.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
65,943	71,024	7,81,992	9,40,511	7,89,888	9,50,891	18·79	23·76

37. The length of the Nira Left Bank Canal is 100·25 miles and that of the Shetphal Channel is 6·5 miles. During the year the perennial section of the canal was extended up to mile 90 while the perennial limit of the channel was up to outlet 19 (inclusive). The area of sugarcane and other perennial crops irrigated, together with the short-termed overlapped cane, was 11,255 acres against 11,141 acres of the preceding year. The total area irrigated was 65,943 acres against 71,965 acres in the last year. The decrease of 6,022 acres was chiefly due to the timely local rainfall for rabi crops and the sudden fall in market prices. The area under perennial blocks during the year was 19,007 acres on the Nira Left Bank Canal and 1,935 acres on the Shetphal Tank against 18,905 acres and 1,714 acres respectively of the preceding year. The area of two seasonal blocks was 22,916 acres on the canal and 1,677 acres on the tank as compared with 24,256 acres and 1,545 acres, respectively, of the preceding year. The average water rate assessment per acre of land irrigated was Rs. 11·86 against Rs. 12·49 in the previous year, the decrease being due to the reduced rabi rates. The total estimated value of crops raised was Rs. 38,57,800 against Rs. 91,31,600 in the preceding year. The decrease was partly due to less areas irrigated but mainly due to the sudden and abnormal fall in the prices of all produce. The irrigation rates represented about 20 per cent. of the value of crops raised. The refunds of revenue granted during the year and remissions sanctioned amounted to Rs. 1,992 and Rs. 4,359, respectively. The cost of measuring establishment for measuring 49,709 acres amounted to 7 pies per acre which is the same as in the preceding year.

Nira Valley Development Project.

38. This project was designed for the complete development of irrigation in the Nira valley by widening and remodelling the Nira Left Bank Canal to irrigate an additional area of 19,000 acres and by the construction of a new dam at Vir to supplement the storage of 24,000 million cubic feet impounded by the Lloyd Dam at Bhatgar referred to

later on. The construction of the Vir Dam estimated to cost about a crore of rupees has now been abandoned as unnecessary. It is considered that by economical distribution of water the storage at Bhatgar will be sufficient to meet all irrigation requirements in the Nira valley both on the old Nira Left Bank Canal and the new Right Bank Canal referred to later on.

39. The remodelling of the Nira Left Bank Canal, which was started in 1925-26 has made considerable progress. During the year distributary No. 18 was completely surveyed and plans and estimates for remodelling it were in hand, as also projects for remodelling other distributaries. The total expenditure on the remodelling work to end of March 1931 amounted to Rs. 28·63 lakhs against the original sanctioned estimate of Rs. 36·69 lakhs, the total expenditure during the year being Rs. 1,22,163. The work will be completed by 1936-37.

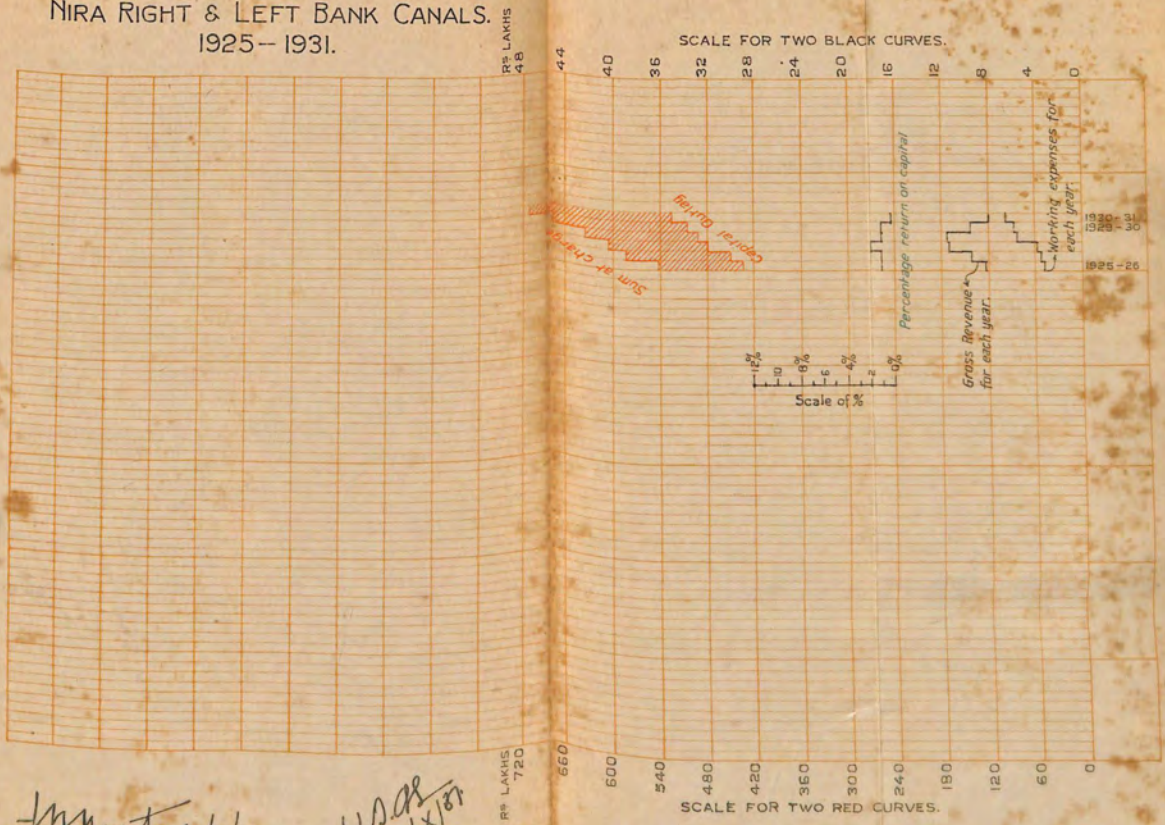
DECCAN IRRIGATION CIRCLE.

40. The main feature of the rainy season was that there were no ante-monsoon showers and consequently facilities for tillage operations were not available. Regular monsoon commenced in the third week of June. In July the rainfall was very deficient and in August it was normal. In the first week of September rain again commenced and was well distributed. More than normal rain was recorded in this month, and it varied from 20 to 40 per cent. in excess of the normal in some of the talukas in the east Deccan. It was most favourable for sowing rabi crops. The rain which commenced in September continued till about 10th October and the fall was normal. This was again followed by rain in the first week of November and it was well distributed in the major portion of the east Deccan. In spite of the rainfall being generally normal, the winter was not normal. There were many cloudy days in December and January and the temperature was higher than normal for a long period. This caused early ripening of the cane crop and increase of disease in jowar and wheat crops which very badly affected the yield in spite of the good rainfall. The season was also favourable for fungus diseases. The September rain affected the yield of the bajri and cotton crops. On the whole, the season was not favourable to kharif and rabi crops in jirayat lands and the yield of both crops was far below normal.

41. The most paying crop in the Deccan is sugarcane and it is only by growing a considerable amount of cane in suitable areas that the Deccan Canals can be made productive, apart from their protective character. The slump in the price of sugarcane products and the increase in working cost have made any extensive cultivation of sugarcane impossible. The low prices have hit the cane grower badly and the irrigators are averse to growing more cane and such ordinarily paying crops as cotton and groundnut.

42. The total area irrigated in this Circle during the year was 101,821 acres against 109,711 acres of the previous year and the gross revenue amounted to Rs. 14·44 lakhs against Rs. 16·37 lakhs of the last year.

FINANCIAL RECORD
for
NIRA RIGHT & LEFT BANK CANALS.
1925 -- 1931.


Rs. LAKHS
48
Rs. LAKHS
720
SCALE FOR TWO BLACK CURVES.
44 40 36 32 28 24 20 16 12 8 4 0
660 600 540 480 420 360 300 240 180 120 60 0
SCALE FOR TWO RED CURVES.
Sum at Charge
Capital Outlay
Percentage return on capital
Gross Revenue for each year.
Working expenses for each year.
1930-31
1929-30
1925-26
12½% 10 8⅓% 6 4% 2 0%
Scale of %

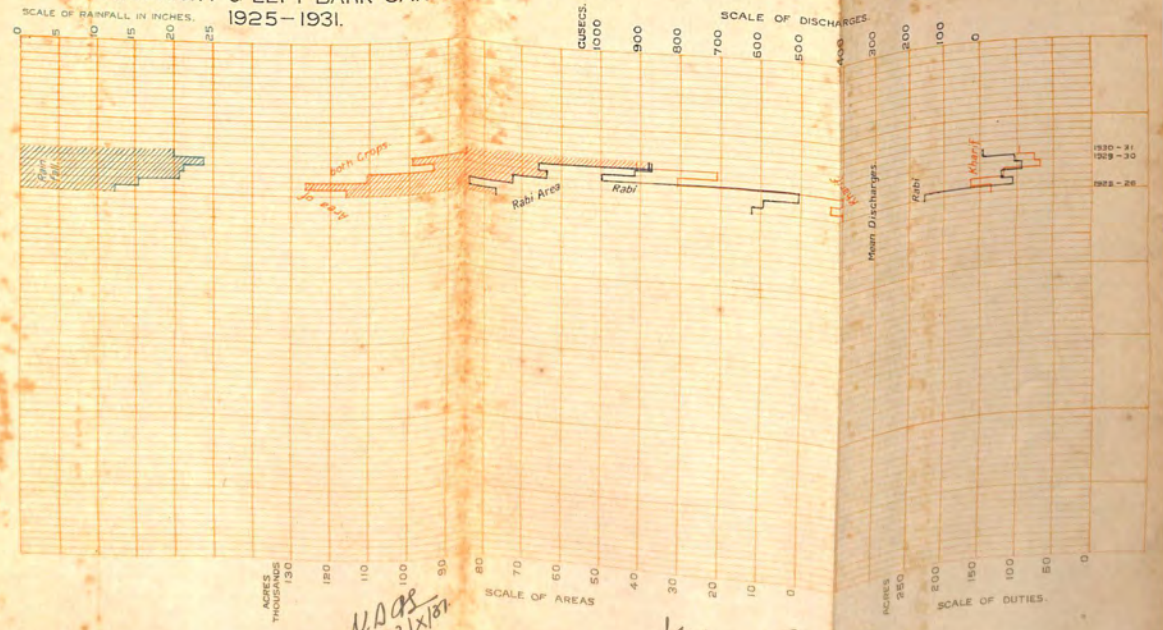
L.W. Hunter 30/10/31

SUPERINTENDING ENGINEER,
DECCAN IRRIGATION CIRCLE.

N.P.C. 23/X/31

EXECUTIVE ENGINEER,
MALSIRAS DIVISION.

WORKING RECORD
for
NIRA RIGHT & LEFT BANK CANALS.
1925–1931.



N.D.C.B. 23/X/31

EXECUTIVE ENGINEER,
MALSIRAS DIVISION.

30/10/31

SUPERINTENDING ENGINEER,
DECCAN IRRIGATION CIRCLE.

MALSIRAS AND MUTHA CANALS DIVISIONS.

LLOYD DAM AND NIRA RIGHT BANK CANAL.

43. The Nira Right Bank Canal is the largest canal in the Deccan. The original estimate of the project framed in 1910 provided for (i) raising the dam at Bhatgar by 60 feet so as to increase its storage capacity from 5,300 million cubic feet to 24,000 million cubic feet, (ii) a canal 109 miles long on the right bank of the Nira river having a capacity at head of 1,500 cusecs, and (iii) widening the existing Nira Left Bank Canal so as to increase its discharge from 456 to 760 cusecs. The total cost was estimated at about Rs. 258 lakhs and the area to be irrigated annually at 190,000 acres. The project was submitted to the Government of India in May 1911, sactioned by the Secretary of State in June 1912 and the work was started in the same year. Before taking in hand the work of raising the Bhatgar Dam a thorough investigation was made into its design and estimates with the result that it was decided on technical grounds to abandon the original proposal for raising the dam and to construct an entirely separate structure. Owing to this change and to the unprecedented rise in the cost of labour and materials which took place from about the year 1916, in consequence of the Great War, a revised estimate was framed in 1920 for Rs. 491 lakhs and submitted to the Government of India in September 1921. The revised project provided for (i) a new dam at Bhatgar to increase the storage from 5,300 million cubic feet to 24,000 million cubic feet, (ii) a canal on the right bank of the Nira river 106½ miles long, and (iii) the expenditure of Rs. 3¾ lakhs already incurred on widening the Nira Left Bank Canal. It was anticipated that 132,000 acres would be irrigated annually and the gross revenue would amount to Rs. 15,22,000 and the net revenue to Rs. 11,92,000, giving a return of 2·4 per cent. on the capital outlay. The revised project was sanctioned by the Secretary of State in June 1922.

44. The Lloyd Dam at Bhatgar, 190 feet high, 5,333 feet long including the waste weir (4,266 feet long excluding the waste weir) and 124 feet wide at the base, was completed in 1928 at a cost of Rs. 172 lakhs. It is one of the largest in the world and contains 21½ million cubic feet of masonry. It supplies water both to the old Nira Left Bank Canal and the new Right Bank Canal. The lake formed by the dam has a length of 17 miles at full supply level and a storage capacity of 24,000 million cubic feet. The catchment area is 128 square miles and the rainfall in the catchment varies from 250 inches in the Ghats to 40 inches at Bhatgar. In addition to the sluices for letting out water for irrigation there are 81 waste weir gates, 10′×8′ in size (45 being automatic and 36 rolling) which control and regulate the flood level in the lake.

45. Practically all deep cutting and high banks of the Nira Right Bank Canal have been completed. The progress on branches and distributaries is equally satisfactory. The acceleration of progress in recent years made it possible to issue water from the canal for rabi crops during the year 1924-25. The canal commands lands in the Satara and Sholapur Districts and in Phaltan State and ends near Mohod in Sholapur District, the total length being about 106½ miles. The designed discharges of the

canal at head and at tail are 1,500 and 414 cusecs with full supply depths of 8 and 6·5 feet respectively. The culturable area commanded by the scheme is 448,000 acres, of which 132,000 acres will be irrigated annually when the canal is fully developed. The distribution system is being constructed on uptodate principles and the latest types of measuring devices are being provided at the distributary heads and also at frequent intervals on the channels. Improved types of outlets and falls have been introduced, and care has been taken to maintain correct discharging capacity and efficiency in all parts of the distribution system. The whole perennial area under the canal has been carefully surveyed and soil classification carried out before designing channels, while areas unsuitable for perennial crops have been determined and indicated on maps.

46. Against the total project estimate of Rs. 491 lakhs the expenditure incurred up to the end of the year under report amounted to Rs. 395 lakhs. The expenditure incurred on maintenance and repairs during the year was Rs. 97,397 and the outlay on extensions and improvements was Rs. 799.

47. On 1st April, the level of water in Lake Whiting was 115·9 feet above the sill of the sluices, the corresponding contents being 14,415·36 million cubic feet. The lowest level of 109·9 feet was reached on 22nd June, the contents being 10,761·88 million cubic feet. The monsoon then commenced and the lake filled to its full supply level of 143 feet on 29th August, the corresponding contents being 24,197·9 million cubic feet. This level was maintained till 17th October, when the draw-off for irrigation commenced. On 31st March, the level was 118·75 feet above the sill, the corresponding contents being 15,334 million cubic feet. The run-off from the catchment of the lake (128 square miles) amounted to 34,477 million cubic feet. The rainfall gauged at Bhatgar was 50·88 inches, while the rainfall in the canal tract averaged 20·52 inches.

48. The following table gives the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Area irrigated.		Irrigation assessment.		Gross assessed revenue.	
1930-31.	Average.	1930-31	Average.	1930-31.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs
18,894	15,786	1,06,952	1,28,160	1,15,700	1,31,047

Working expenses.		Realisations.		Rainfall.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
2,51,915	2,11,708	1,07,597	1,17,244	20·52	20·61

The increase in the area irrigated was due mostly to the development of irrigation. The increase in working expenses was due to the greater length of distributaries and other works to be maintained and to extension of irrigation on the canal. The fall in revenue was due to the concessional half rates sanctioned by Government for crops irrigated during the rabi season on account of the prevailing depressed conditions. The area under sugarcane during the year was only 388 acres and the area of two-seasonal or rabi leases was 13,453 acres. The area of perennial blocks sanctioned and irrigated during the year amounted to 662 acres. The perennial limit of the canal is mile 75. The demand for perennial blocks has not been as brisk as was expected and so with a view to developing the canal, Government have granted certain concessions for a period of three years from 1931-32. The remissions sanctioned during the year amounted to Rs. 4,488, and the refunds to Rs. 140. The cost of measuring establishment amounted to Rs. 1,076, which gives a rate of 11 pies per acre against 1 anna and 1 pie per acre in the previous year.

MALSIRAS DIVISION.

Mhaswad Tank.

49. This irrigation tank is formed by an earthen dam across the Man river, 9,000 feet long and 80 feet high at its highest point. It has a storage capacity of 2,602 million cubic feet and irrigates lands in the Sholapur District though it is situated on the eastern border of the Satara District. The capacity of the tank is considerable but the supply is not reliable owing to the precarious nature of the rainfall in its catchment. The designed discharges of the two Mhaswad Canals at head are 180·7 and 176·93 cusecs with the full supply depth of 4 feet and the tail discharges are 180 and 125·76 cusecs with depths of 3 and 4 feet respectively. It is intended to utilise the discharge available from these canals to supplement the discharge at the tail of the Nira Right Bank Canal (Branch No. 3) when it is ready to take it. The Mhaswad Canal system will then cease to appear as a separate entity and will be merged into the Nira Right Bank Canal system.

50. On 1st April, the level of water in the tank was 15·9 feet above the sill, the corresponding contents being 1,372·26 million cubic feet. Replenishment started from 31st August and before the commencement of the rabi season the level rose to its full height of 24 feet above the sill of the outlet, the contents being 2,601·17 million cubic feet, and the waste weir began to overflow from 4th October. This made it possible to satisfy the full demands of the rabi season. On 31st March, the level was 16·35 feet, the corresponding contents being 1,431·1 million cubic feet. The average of the several rain gauge readings in the catchment of the tank (480 square miles) was 18·84 inches and the run-off amounted to 12,313 million cubic feet. The average rainfall in the canal tract was 19·07 inches.

51. The following table shows the results of irrigation, revenue etc., during the year as compared with the average of the past three years :—

Area irrigated.		Irrigation assessment.		Gross assessed revenue.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
3,559	6,525	19,824	52,659	28,366	61,945

Working expenses.		Realisations.		Rainfall.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
22,019	16,340	38,975	48,573	19·07	23·92

The decrease in the area irrigated and the corresponding decrease in assessment was due to timely rainfall during the monsoon and rabi seasons and the consequent lack of demand for canal water. The area under sugarcane on seasonal passes during the year was 36 acres. The refunds of revenue sanctioned amounted to Rs. 1,891 and the remissions to Rs. 7. The cost of measuring establishment was nil during the year as the work was done with the help of patkaris.

MUTHA CANALS DIVISION.

Mutha Canals including Matoba Tank.

52. This system came into operation in 1874-75. The canals were constructed at a cost of about Rs. 65½ lakhs with a large Ghatfed reservoir called Lake Fife on the Mutha river at Khadakwasla about 12 miles from Poona. The dam is of masonry 107 feet high and spans the valley of the Mutha river and the lake has a very reliable catchment. The water of the lake is used for supplying drinking water to Poona and for irrigation. The system comprises two canals, the Right and the Left Bank, 70 and 18 miles long respectively. The maximum designed discharges of the two canals at head are 412 and 38·5 cusecs respectively. The Matoba Tank is a tail tank receiving its supply from the Right Bank Canal during the monsoon months. The Mutha Canals, particularly the Right Bank Canal, play a very important part in the welfare of Poona City and the surrounding country. They supply the City and the Cantonment with drinking water and have, besides irrigating ordinary crops, fostered the cultivation of fruit, vegetables, fodder and sugarcane within easy reach of this large city and important military station. The supply in Lake Fife is, however, insufficient to meet the increasing demands on account of the water supply to Poona and cultivation on the two canals and

a project for increasing the storage either by building a new dam or by raising the existing dam and for remodelling and extending the Right Bank Canal is under preparation.

53. On 1st April, the level of water in Lake Fife was 18·1 feet above the sill of the canal sluices, the corresponding contents being 1,464 million cubic feet. The lowest level of 6·65 feet was reached on 21st June, the contents being 478 million cubic feet. Thereafter replenishment commenced and the lake overflowed from 29th June. The maximum floods occurred on 3rd and 4th July. The draw-off for irrigation from the storage commenced on 12th November when water was at its full supply level of 34 feet the contents then being 3,643 million cubic feet. On 31st March, the level was 19·8 feet, the corresponding contents being 1,646 million cubic feet. The average of the readings of the several rain gauges in the catchment of the lake (196 square miles) was 115·8 inches and the run-off amounted to 50,778 million cubic feet. The rainfall in the canal tract was 21·79 inches. The Matoba Tank dried up on 12th March and remained empty till 25th May when it received some replenishment due to local rainfall. The tank obtained further replenishment from local rain and reached the level of 12·65 feet on 8th June, the contents being 24·31 million cubic feet. Regular replenishment from the Mutha Right Bank Canal commenced from 28th July and the tank reached its full supply level of 29 feet on 3rd September when it began to overflow, the contents then being 220·55 million cubic feet. The overflow lasted for 9 days. On 31st March, the level of water was 10·85 feet, the contents being 15·76 million cubic feet.

54. The following table gives the results of Irrigation, revenue etc., during the year as compared with the average of the past three years :—

Area irrigated.		Irrigation assessment.		Gross assessed revenue.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
14,637	14,368	2,14,741	2,28,828	3,76,507	3,97,383

Working expenses.		Realisations.		Rainfall.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
1,00 816	1,34,000	4,03,954	3,70,188	21·79	22·52

55. The perennial section of the Mutha Right Bank Canal is up to mile $23\frac{5}{8}$, while the whole length of the Left Bank Canal is perennial. Due to timely rainfall there was no demand for canal water during the rabi season. Further the concession of half rates for the rabi season adversely affected the irrigation revenue. The areas of two-seasonal leases under the canals and the Matoba Tank during the year were 689 and 1,704 acres respectively. The refunds of revenue sanctioned amounted to Rs. 163 and the remissions to Rs. 2,488. The cost of measuring establishment amounted to Rs. 1,185, which gives a rate of 1 anna and $3\frac{1}{2}$ pies per acre against 1 anna and 4 pies of the previous year. The quantity of water supplied during the year to the Poona Cantonment was 103 million gallons and to the Poona City Municipality 2,270 million gallons, the corresponding revenue being Rs. 40,838 and Rs. 90,797 as compared with Rs. 39,100 and Rs. 79,904 of the previous year. The expenditure incurred on extensions and improvements and maintenance and repairs during the year amounted to Rs. 831 and Rs. 35,139 respectively.

Kasurdi Tank.

56. This tank, which was empty at the end of the previous year, received replenishment on 25th May. It overflowed twice, once on 25th May and again on 10th June. Water was issued for irrigation of rabi crops and the tank finally went dry on 11th December.

Shirsuphal Tank.

57. On 1st April, the level of water in the tank was 25·44 feet, the corresponding contents being 192·18 million cubic feet. The lowest level of 20·48 feet was reached on 30th August, the contents then being 100·92 million cubic feet. Water was issued for irrigation of rabi and two-seasonal crops. On 31st March, the level of water in the tank was 21·5 feet, the contents being 132·04 million cubic feet. The area under the two-seasonal leases sanctioned during the year was 756 acres. Remissions of Rs. 454 were granted during the year.

Bhadalwadi Tank.

58. On 1st April, the level of water in the tank was 25·4 feet, the contents being 74·25 million cubic feet. The lowest level of 18·4 feet was reached on 26th August, the contents being 22·22 million cubic feet. The tank received replenishment on 3rd September and overflowed on 2nd November, when the draw-off for irrigation commenced. On 31st March, the level of water was 29·9 feet above the sill of the outlet, the contents being 122·9 million cubic feet. The area under two-seasonal leases sanctioned under the tank was 1,261 acres. The remissions granted during the year amounted to Rs. 198.

59. The following table gives the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Name of tank.	Area irrigated.		Irrigation assessment.		Gross assessed revenue.	
	1930–31	Average.	1930–31	Average	1930–31	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Kasurdi	65	73	200	318	1,357	2,321
Shirsuphal	1,163	857	4,057	5,225	4,735	5,631
Bhadalwadi	1,437	897	4,295	5,588	4,403	6005

Name of tank.	Working expenses.		Realisations.		Rainfall.	
	1930–31.	Average	1930–31	Average.	1930–31	Average.
	Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
Kasurdi	1,253	1,269	1,742	2,133	16·95	22·37
Shirsuphal	2,955	15,143	4,893	4,692	14·90	20·50
Bhadalwadi	4,249	4,467	2,514	5,704	22·20	23·46

The increase in areas irrigated under the Shirsuphal and Bhadalwadi Tanks was due to the cultivators having renewed the two-seasonal leases which they had cancelled in 1928-29. The decrease in irrigation assessment was due to the concession of half rates sanctioned by Government for crops raised during the rabi season. The three tanks were maintained and repaired at a cost of Rs. 466, Rs. 1,078 and Rs. 1,578 respectively.

NASIK IRRIGATION DIVISION.

GODAVARI CANALS.

60. This is one of the most important major irrigation works undertaken in the Deccan for the protection of areas liable to famine. It was started in 1907 and completed in 1915-16 at a cost of about one crore of rupees. The system comprises (1) a storage reservoir called

Lake Beale on the Darna river, a tributary of the Godavari, about 20 miles from Nasik, (2) a pick-up weir at Nandur Madhmeshwar on the Godavari, 47 miles below the Darna Dam, which impounds the water let down from the dam for distribution to the canals and (3) two canals, the Right Bank Canal 69 miles long, which serves the northern tracts of Ahmednagar District, and the Left Bank Canal 48 miles long, which irrigates lands north of the Godavari valley in the Nasik and Ahmednagar Districts. The Darna Dam inclusive of its waste weir is a little over one mile long and has a maximum height of 92 feet above its lowest foundations. The lake has a storage capacity of 7,763 million cubic feet. The cost of the dam was Rs. 34·27 lakhs. The weir at Nandur Madhmeshwar is a work of considerable magnitude, its length being 3,618 feet, inclusive of the Right and Left Bank Canal Regulators situated at either end of the weir. It has a maximum height of 34 feet above the river bed. Scouring sluices have been constructed close to the head regulators of the two canals with the object of keeping the approach channels clear of silt. The total area under command of the canals is 232,390 acres, of which some 80,000 acres are irrigable annually. The two canals (Right and Left Bank) are designed to discharge 384 and 228 cusecs at head, with full supply depths of 7 and 6 feet respectively, and the tail discharges are 114·41 and 35 cusecs with full supply depths of 5 and 3 feet respectively. Irrigation on these canals has developed so rapidly as to render the provision of additional storage works a problem for consideration in the near future. An additional storage of 7,000 million cubic feet is considered necessary to develop fully the Godavari area and a scheme for a new storage at Gangapur on the Godavari river near Nasik in under investigation.

61. On 1st April, the level of water in Lake Beale was 48·8 feet above the sill of the sluices which are at R.L. 1810, the corresponding contents being 4,018 million cubic feet. The lowest level was reached on 16th June, when it was 32·8 feet above the sill, the contents being 1,342·7 million cubic feet. The lake received its first replenishment on 19th June and the level rose to the sill of the waste weir (55·1 feet above the sill of the outlet sluices) on 2nd July, the corresponding contents being 4,786·5 million cubic feet. The highest level of 65 feet which is the full supply level was reached on 11th September, the contents then being 7,763 million cubic feet. This level was maintained till 12th December when the draw-off for irrigation from the storage commenced and the level gradually went down to 52·25 feet by 31st March, the contents then being 4,080·2 million cubic feet. The yield from the catchment of the lake (156 square miles) was 37,109 million cubic feet, the average of the rain gauges being 113·5 inches. The rainfall in the canal tract was 27·6 inches on the Right Bank Canal and 38·25 inches on the Left Bank Canal. The rainfall both in the catchment of the lake and along the canal tracts was exceptionally good. The demand for irrigation in the kharif season was accordingly poor. The rabi season was also affected and even areas that had been applied for and sanctioned did not require more than one or two waterings.

62. The following table gives the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

	Area irrigated.		Irrigation assessment.		Gross assessed revenue.	
	1930-31	Average.	1930-31	Average.	1930-31	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Lake Beale	562	417	2,082	1,638	3,86,114	4,86,159
Godavari Right Bank Canal	13,033	15,387	1,96,820	2,75,109		
Godavari Left Bank Canal.	9,757	9,900	1,52,872	1,82,911		

	Working expenses.		Realisations.		Rainfall.	
	1930-31	Average.	1930-31	Average.	1930-31	Average.
	Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
Lake Beale	2,19,478	3,23,538	3,35,197	5,99,279	..	..
Godavari Right Bank Canal					27·60	11·89
Godavari Left Bank Canal .					38·25	20·29

The decrease in the area irrigated and the consequent decrease in assessment on the whole Godavari system was due to less perennial irrigation during the year. Owing to the timely and plentiful rainfall the condition of irrigated crops was in general very good. The fall in revenue was also due to the general depressed conditions and the concession of half rates for crops raised in the rabi season sanctioned by Government. The areas of perennial blocks and two-seasonal leases sanctioned under the canals during the year were 4,649 acres and 1,926 acres respectively. The perennial limit of the Right Bank Canal extends up to mile 60 and that of the Left Bank Canal up to mile 42. The cost of measuring establishment amounted to Rs. 410 which works out to 8 pies per acre against 7 pies of the previous year. The cost was rather high owing to the scattered nature of irrigation. The refunds of revenue amounted to Rs. 1,057 and the remissions to Rs. 447. During the year, the expenditure on maintenance and repairs to the canals

amounted to Rs. 82,428 and the expenditure incurred on extensions and improvements was Rs. 242.

Chankapur Tank—Girna Left Bank Canal.

63. This is a comparatively small irrigation system in the Nasik Collectorate, consisting of a storage reservoir at Chankapur and the Girna Left Bank Canal, about 19 miles long. The tank is situated on the Girna river, a tributary of the Tapti, and is formed by a masonry dam 140 feet high, impounding 1,500 million cubic feet of water. The dam was completed in 1909-10. The total area under command of the canal is 29,182 acres, of which 8,500 acres will be irrigated annually when irrigation is fully developed. The designed discharge of the canal at head is 90 cusecs and at tail 15 cusecs, the depths at full supply being 4½ and 2 feet respectively. The canal has been in operation since 1909-10, its extension being completed in 1920-21.

64. On 1st April, the level of water in the tank was 77 feet above the sill of the lowest outlet, the corresponding contents being 829 million cubic feet. The level dropped to 42·3 feet by 17th June and replenishment commenced on 20th June. The level gradually rose to 91·85 feet above the sill of the outlet on 23rd September, the contents then being 1,538·48 million cubic feet and the draw-off for irrigation commenced on 8th October. The level on 31st March was 73·9 feet above the sill of the outlet, the corresponding contents being 726·35 million cubic feet. The run-off from the catchment of the tank (100 square miles) was 4,298 million cubic feet, the average of the rain gauge readings being 44·22 inches. The rainfall in the canal tract was 22·17 inches. The rainfall both in the catchment of the tank and along the canal was good.

65. The following table shows the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Area irrigated.		Irrigation assessment.		Gross assessed revenue.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
5,482	5,062	38,930	47,196	39,799	48,347

Working expenses.		Realisations.		Rainfall.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
84,619	60,501	18,163	40,639	22·17	23·52

The area irrigated increased owing to better demand for canal water, but the assessment was less than the average due to the concessional water rates sanctioned by Government for crops raised in the rabi season. The cost of measuring establishment amounted to Rs. 485 which works out to 1 anna and 5 pies per acre as compared with 1 anna and 3 pies in the previous year. The high cost was due to the high cost of labour and the scattered nature of irrigation. The expenditure incurred on maintenance and repairs amounted to Rs. 13,557 and a sum of Rs. 20,809 was spent on remodelling the scouring sluices of the tank. The areas of perennial crops and two-seasonal leases sanctioned during the year were 363 and 159 acres respectively. The refunds of revenue sanctioned amounted to Rs. 767 and were due to the damage caused by frost.

Kadwa River Works.

66. These works which came into operation in 1868-69 consist of three small canals—viz., Palkhed, Ojhar Tambat and Wadali, taking off from weirs across the Kadwa river and its tributary the Banganga and comprising 38 miles of canals and distributaries. The storage is at Waghad. The Waghad Tank is a Ghat-fed reservoir on the Kolwan river in the Nasik District. It is remarkable for the size of its earthen dam which attains a height of 96 feet where it crosses the gorge of the river. The designed discharges of the Palkhed Canal at head and at tail are 90 and 15 cusecs respectively, the corresponding depths at full supply being 4½ and 2 feet. The designed discharges of the Ojhar Tambat Canal at head and at tail are 33 and 5 cusecs respectively, the depths at full supply being 3 feet and 1 foot respectively. The designed discharges of the Wadali Canal at head and at tail are 19 and 5 cusecs respectively, the corresponding depths at full supply being 2 feet and 1 foot.

67. On 1st April, the depth of water in Waghad Tank was 34·5 feet above the sill of the outlet, the contents being 271·35 million cubic feet. The level fell gradually to 19·85 feet on 17th June, the contents then being 82·64 million cubic feet. The tank received replenishment from 18th June and filled to its full supply level of 48 feet on 14th September, the contents then being 605·55 million cubic feet. The maximum depth of flood above the crest of the waste weir was 8 feet on 14th September. The automatic waste weir gates were finally closed on 23rd September when the depth was 47·3 feet above the sill of the outlet, the contents being 582·37 million cubic feet. Draw-off for irrigation commenced on 15th December with 46·65 feet depth of water in the tank, representing a volume of 571·31 million cubic feet. The level fell to 37·85 feet on 31st March, the contents, being 335·9 million cubic feet. The run-off from the catchment of the tank (29 square miles) was 3,565 million cubic feet, the average of the rain gauge readings being 63·4 inches. The average rainfall in the canal tract was 28·6 inches. The rainfall both in the catchment of the tank and along the canal tract was good,

68. The sub-joined table gives the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Name of Canal.	Area irrigated.		Irrigation assessment.		Gross assessed revenue.	
	1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Palkhed	1,508	1,216	17,466	18,756	42,619	44,970
Ojhar Tambat ..	881	784	12,314	12,221		
Wadali	822	714	9,938	9,935		

Name of Canal.	Working expenses.		Realisations.		Rainfall.	
	1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
	Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
Palkhed	27,178	50,973	34,654	42,722	27·23	26·12
Ojhar Tambat ..					40·11	24·96
Wadali					18·47	22·43

The increase in the area irrigated was due to greater demand for canal water in the rabi season. Perennial irrigation on the entire lengths of the canals is allowed subject to the prohibition of sugarcane cultivation within a quarter mile of villages. Owing to the limited supply in Waghad Tank, the canals though classed as perennial are not really so and sugarcane has usually to depend on well water at the end of each season. The area of two seasonal leases sanctioned during the year was 209 acres. The refunds of revenue amounted to Rs. 26 and the remissions to Rs. 7. The expenditure incurred on maintenance and repairs was Rs. 10,826. The cost of measuring establishment amounted to Rs. 301, which gives a rate of 1 anna and 6 pies per acre as compared with 1 anna and 4 pies of the previous year. This high rate was due to the high cost of labour and the scattered nature of irrigation.

Parsul Tank.

69. This small tank depends solely on local rain for its supply and generally stores sufficient water for the monsoon and rabi crops. On 1st April, the level of water in the tank was 25·7 feet above the sill of the outlet, the contents being 67·82 million cubic feet. The level went down to 14·5 feet on 15th June, the contents being 24·26 million cubic feet. Thereafter replenishment was received and the level gradually rose to 35·1 feet

on 5th July when the waste weir overflowed, the contents then being 120·26 million cubic feet. The highest level reached during the year was 35·3 feet on 13th September, the contents being 121·04 million cubic feet. The level on 31st March was 27·7 feet above the sill of the outlet, the corresponding contents being 77·16 million cubic feet. No area under rabi leases was applied for and sanctioned during the year. The irrigators did not take water on account of the increased rates and there was practically no irrigation. The refunds of revenue amounted to Rs. 11.

70. The following table shows the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Area irrigated.		Irrigation assessment.		Gross assessed revenue.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
51	1,444	424	8,229	624	8,525

Working expenses.		Realisations.		Rainfall.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
1,457	1,948	1,381	6,500	20·5	18·35

71. The cost of measuring establishment was 4 annas and 6 pies per acre against 1 anna and 7 pies in the previous year. This high rate was due to the area being very small and scattered.

AHMEDNAGAR DIVISION.

PRAVARA RIVER WORKS.

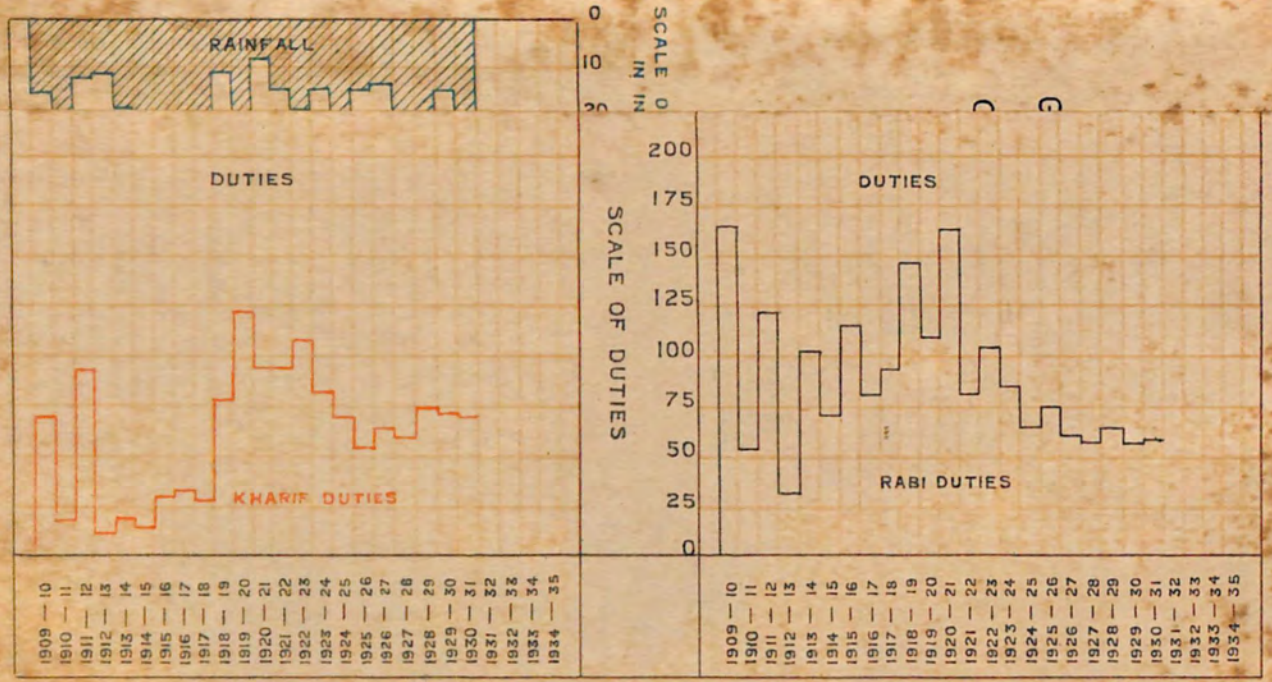
72. This system which was constructed at a cost of Rs. 1½ crores comprises (1) the Wilson Dam at Bhandardara on the Pravara river, which is one of the highest dams in the world, (2) the pick-up weir on the river at Ojhar 53 miles below the dam and (3) two canals, 33 and 48 miles long respectively, which take off at the weir. The canals irrigate lands in Ahmednagar District and command an area of 228,720 acres, of which 57,000 acres will be irrigated annually when the canals are fully developed. The designed discharges of the two canals (Pravara Right and Left Bank) at head are 152·62 and 530 cusecs respectively, the corresponding full supply depths being 5 and 8 feet, and the designed discharges at tail are 81·79 and 102 cusecs respectively with a full supply depth of 3 feet.

The first few miles of both the canals have become heavily silted and weed-infested due to insufficient bed slope and proposals to remodel these sections are under consideration. The Wilson Dam which forms Lake Arthur Hill was commenced in 1911 and completed in 1926. The catchment area of the lake is 47 square miles situated in the Ghats with an assured run-off. The dam which is designed to impound 270 feet depth of water as a maximum is about 1,600 feet long at the top and is constructed across a gorge in the Pravara river valley. At present water is impounded to a depth of 260 feet giving a storage of 10,086 million cubic feet which can be increased to 12,092 million cubic feet with a depth of 270 feet by erecting automatic gates on the waste weir. The pick-up weir at Ojhar is 890 feet in length. Silt has accumulated in the weir basin to such an extent that it cannot hold even a full day's supply for the canals. The undertaking of necessary remedial measures is under contemplation. In order, however, to ameliorate these defective conditions a temporary wall 3 feet high is built over the weir every year after the monsoon as a temporary measure so as to increase the storage.

73. On 1st April, the level of water in Lake Arthur Hill was 218·5 feet above the sill of the outlet, the corresponding contents being 4,623·61 million cubic feet. The lowest level of 175·3 feet was reached on 27th June, the contents being 1,857·2 million cubic feet. Replenishment commenced from 27th June and the full supply level of 260 feet was reached on 19th July, the contents being 10,086 million cubic feet. The maximum flood occurred on 23rd July when the level was 264 feet and lasted for about 12 hours. The full supply level was maintained till 10th October, when the draw-off for irrigation commenced. The level gradually fell to 225·9 feet on 31st March, the contents then being 5,349·05 million cubic feet. The yield from the catchment of the lake (47 square miles) was 36,919·64 million cubic feet, the average of the several rain-gauge readings being 160·5 inches. The average rainfall in the canal tract was 27·37 inches. The rainfall both in the catchment of the lake and along the canal tracts was satisfactory. It was timely and evenly distributed over the season and throughout the canal area. The late rabi rains were also very satisfactory.

74. The following table gives the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Name of canal.	Area irrigated.		Irrigation assessment.		Gross assessed revenue.	
	1930–31.	Average.	1930–31.	Average.	1930–31.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Pravara Right Bank Canal.	8,211	8,926	96,892	1,40,771	4,37,499	5,84,479
Pravara Left Bank Canal.	21,117	22,065	3,28,087	4,28,672		



23/1931

EXECUTIVE ENGINEER,
AHMEDNAGAR DIVISION.

30/4/31

SUPERINTENDING ENGINEER,
DECCAN IRRIGATION CIRCLE.

GODAVARI AND PRAVARA CANALS
COMBINED WORKING RECORD
UP TO 1931.

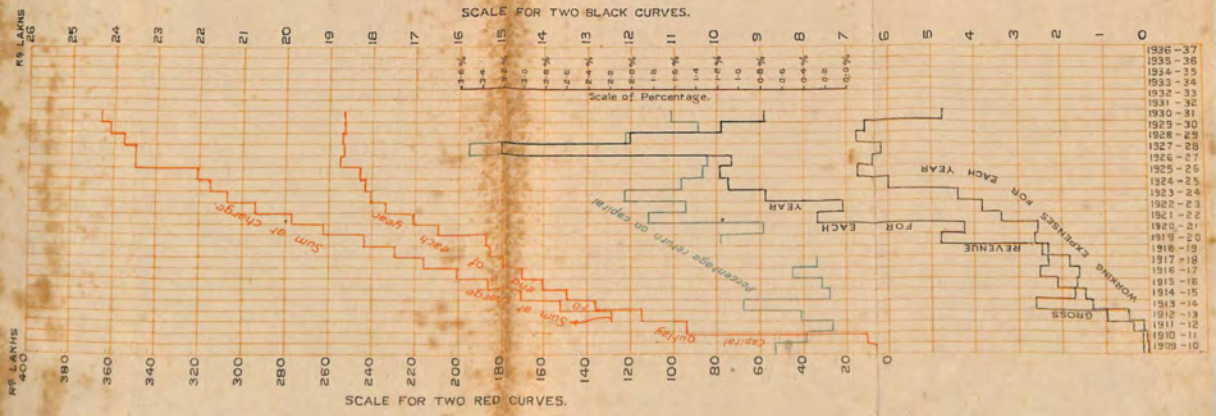
30/4/31

SUPERINTENDING ENGINEER
DECCAN IRRIGATION CIRCLE

EXECUTIVE ENGINEER
AHMEDNAGAR DIVISION

GODAVARI & PRAVARA CANALS COMBINED
FINANCIAL RECORD
1930 – 31

NAME OF CANAL	CONSTRUCTION COMMENCED IN.	CANAL WAS OPENED IN.
GODAVARI CANALS	1907	1911 – 12
PRAVARA CANALS	1909	1909 – 10



30/10/31

SUPERINTENDING ENGINEER,
DECCAN IRRIGATION CIRCLE.

23/10/30

EXECUTIVE ENGINEER,
AHMEDNAGAR DIVISION.

Name of canal.	Working expenses.		Realisations.		Rainfall.	
	1930–31.	Average.	1930–31.	Average.	1930–31.	Average.
	Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
Pravara Right Bank Canal.	2,56,874	3,23,948	5,59,014	6,34,591	29·85	20·49
Pravara Left Bank Canal.					25·95	22·33

The decrease in the area irrigated and the consequent fall in revenue was due to less seasonal irrigation on account of the satisfactory and timely rainfall during both the monsoon and rabi seasons, as a result of which two-seasonal leases of about 4,545 acres were cancelled and exempted from payment of water rates during the year under report. The concession of half rates for the rabi season further affected the revenue. The refunds of revenue sanctioned amounted to Rs. 4,635 and the remissions to Rs. 10. The large refunds were due to the cancellation of *panchanamas* made for water taken for Nidwa. The whole length of the Pravara Right Bank Canal is perennial, while the perennial limit of the Left Bank Canal is up to mile 38½. The total area of perennial blocks sanctioned on the two canals during the year was 10,589 acres. The cost of measuring establishment amounted to Rs. 971½, which works out to 6 pies per acre which is the same as in the previous year.

Bhatodi Tank.

75. This is a small tank situated on the Mehekari river about 12 miles from Ahmednagar. It depends entirely on local rain for its supply which generally suffices for the monsoon and part of the rabi season. The tank has silted heavily and its capacity reduced from 154 to 39·44 million cubic feet. To increase the capacity it is proposed to raise the level of the waste weir by one foot. The total rainfall during the year was 18·77 inches. The tank had dried up on 14th December 1929 and remained empty till 4th September 1930 when it received its first replenishment. The full supply level (*viz.* R.L. 92·30, the contents being 40·19 million cubic feet excluding silt) was reached on 13th September and the highest level reached was R.L. 95·75 on 2nd November. During the year the tank overflowed thrice from 13th to 20th September, from 6th to 11th October and from 30th October to 1st December. Water was issued for irrigation of rabi crops and the tank finally went dry on 5th March.

76. The following table gives the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Area irrigated.		Irrigation assessment.		Gross assessed revenue.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
642	732	1,698	4,070	6,039	8,521

Working expenses.		Realisations.		Rainfall.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
6,817	5,390	7,460	9,227	18·77	23·36

The decrease in the area irrigated and the consequent decrease in irrigation assessment was due to less demand for monsoon water on account of satisfactory rains ; the decrease in assessment was also due to the concession of half rates for the rabi season sanctioned by Government. The cost of measuring establishment amounted to 8½ pies per acre. The expenditure incurred on extensions and improvements and maintenance and repairs during the year amounted to Rs. 1,092 and Rs. 1,363 respectively.

CENTRAL CIRCLE.

SHOLAPUR DIVISION.

77. The area irrigated, gross assessed revenue and working expenses of the four tanks in the Sholapur Division as compared with the average of the preceding three years are given in the following statement :—

Name of tank.	Area irrigated.		Gross assessed revenue.		Working expenses.	
	1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Ekruk	3,999	4,312	1,43,809	1,41,685	18,276	27,757
Koregaon	585	490	1,310	2,467	3,090	2,188
Ashti	4,022	4,293	15,996	26,555	11,950	12,366
Pathri	1,030	1,061	9,228	13,448	5,896	4,308

The decrease in the area irrigated under all the tanks except Koregaon was due to less demand for water on account of timely rainfall. The increase in the case of Koregaon Tank was due to greater demand for water in the rabi season. The decrease in the gross assessed revenue on all the tanks except Ekruk was due to the concessional rate for the rabi season sanctioned by Government. In the case of Ekruk Tank, the increase was due to the higher revenue realised from the non-agricultural interests.

Ekruk Tank.

78. The Ekruk Tank near Sholapur, which came into operation in 1872-73, is an artificial reservoir formed by a large earthen embankment 7,000 feet along with a maximum height of 76 feet. It supplies water not only for irrigation but also to the town of Sholapur, the Mills and the G. I. P. Railway. Under unfavourable conditions of replenishment, which occur periodically, the tank is not able to meet all the demands, agricultural and non-agricultural, made on it and the question of providing a supplementary storage tank is under contemplation.

79. On 1st April, the level of water in the tank was 25·56 feet above the sill of the lowest outlet. This level fell gradually to 22·1 feet on 2nd September. The situation was considered serious and it was decided not to allow water for kharif crops, as there was no certainty of getting replenishment. There was, however, good rainfall in September and in the first fortnight of October, which raised the level of water to 36·5 feet. Water applications for an extra area of about 6,000 acres over and above the leased area were accordingly invited. But owing to timely and sufficient rainfall, the irrigators applied for 1,100 acres only. The mean rainfall gauged at the five stations in the catchment of the tank (159 square miles) was 23·01 inches against 20·52 inches, the average of the preceding three years, and the total replenishment received in the tank amounted to 1,920·03 million cubic feet.

Koregaon Tank.

80. The tank was almost dry from 22nd March to 30th June. With the rainfall of 0·95 inch on 30th June, a replenishment of 1·5 feet was received in the tank. There were then rises and falls in the level of water until the rains in September caused the waste weir to overflow on 5th October. The storage was fully utilised in meeting the demands of the Rabi lease-holders. The rainfall gauged at Koregaon was 20·49 inches against 22·07 inches, the average of the preceding three years.

Ashti Tank.

81. On 1st April, the level of water in the tank was 19·62 feet above the sill of the outlet. The level gradually went down to 5·64 feet on 2nd September. The rains in September improved the storage and there was kharif irrigation of 600 acres. The demands of the lease-holders were fully met. The mean rainfall gauged at the two stations in the catchment of the tank was 18·74 inches against 22·86 inches, the average of the preceding three years, and the total replenishment received in the tank amounted to 657·68 million cubic feet.

Pathri Tank.

82. On 1st April, the level of water in the tank was 26·18 feet over the sill of the outlet. The level gradually went down to 23·74 feet on 18th June. Due to a rainfall of 2·55 inches on 19th June, a replenishment of 2·06 feet was received in the tank. With further replenishments in September, the waste weir overflowed from 12th September. The storage was utilised in meeting the demands of the rabi lease-holders and of the Barsi Municipality. The mean rainfall gauged at two stations in the catchment area of the tank was 24·93 inches against 28·1 inches, the average of the preceding three years.

KHANDESH DIVISION.

Jamda Canals.

83. The source of supply of these canals is the Girna river, supplemented from time to time by water from the Chankapur tank in the Nasik Irrigation Division. The rainfall during the year was generally

seasonal and so there was no great demand for water. The rainfall in the catchment of the canals was 31·68 inches against 24·43 inches, the average of the previous three years. The sub-joined table shows the area irrigated, gross assessed revenue and working expenses as compared with the average of the preceding three years :—

Area irrigated.		Gross assessed revenue.		Working expenses.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1,605	1,295	7,923	10,565	14,988	11,357

The increase in the area irrigated was due to more irrigation in the rabi season on account of better flow in the river. The decrease in the gross assessed revenue in spite of the increase in the area was due to the fall in miscellaneous receipts.

Hartala Tank.

84. The tank derives its supply from local rain and the supply is uncertain. On 1st April, there was no water in the tank. The first replenishment received on 9th September brought in a supply of 9·81 million cubic feet. The maximum storage reached was 53·71 million cubic feet on 24th September. It gradually went down to 19·17 million cubic feet at the close of the year. The rainfall was very seasonal and there was little demand for water for irrigation. The rainfall during the year was 27·04 inches against 27·08 inches, the average of the previous three years. The area irrigated, gross assessed revenue and the working expenses as compared with the average of the preceding three years are given in the following table :—

Area irrigated.		Gross assessed revenue.		Working expenses.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
13	103	388	1,071	990	950

The decrease in the area irrigated and the consequent decrease in the gross assessed revenue was due to there being very little irrigation in the rabi season and no irrigation in the kharif season.

Mhaswa Tank.

85. The tank derives its supply from local rain. The year commenced with a storage of 27·9 million cubic feet in the tank and the first replenishment was received on 19th June, which raised the contents to 59·29 million cubic feet. The storage reached the maximum of

172·4 million cubic feet on 13th September. It gradually fell to 63·61 million cubic feet at the end of the year. The rainfall was seasonal and there was no keen demand for water. The rainfall gauged at the tank was 24 inches against 21·97 inches, the average of the previous three years. The area irrigated, gross assessed revenue and working expenses during the year as compared with the average of the preceding three years are given below :—

Area irrigated.		Gross assessed revenue.		Working expenses.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Acres. 457	Acres. 477	Rs. 2,548	Rs. 2,368	Rs. 2,124	Rs. 1,692

The decrease in the area irrigated was due to less demand for water owing to seasonal rainfall. The increase in the gross assessed revenue was due to the increase in miscellaneous receipts.

Shahada Channel.

86. This channel is fed by the Gomai river which has a perennial flow. The rainfall in the area of the channel was sufficient and seasonal and so there was less demand for irrigation water. The rainfall at Shahada during the year was 37·04 inches against 25·81 inches, the average of the last three years. The area irrigated, gross assessed revenue and working expenses during the year as compared with the average of the preceding three years are given below :—

Area irrigated.				Gross assessed revenue.		Working expenses.	
Patasthal.		Jirayat.					
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Acres. 995	Acres. 1,084	Acres. 538	Acres. 679	Rs. 9,660	Rs. 9,854	Rs. 4,055	Rs. 7,369

Lower Panjhra River Works.

87. These works comprise 8 bandharas and 9 channels between Dhulia and Betawad on the Panjhra river and the Mukti tank situated about 4 miles from Dhulia. The channels get their supply from the river but when that becomes insufficient, it is supplemented by water from the Mukti tank. On 1st April, the contents of the tank were 91·85 million cubic feet which subsequently fell to 34·66 million cubic feet. The first replenishment was received on 17th June and raised the contents to 34·69 million cubic feet. The maximum storage reached was 320·03 million cubic feet on 11th September, when the tank overflowed. The storage went down gradually till it reached 92·02 million cubic feet at the end of the

year. The rainfall in the area of the Lower Panjhra River Works started well, but there was a long break at the end of the season and consequently there was increased demand for water in the Rabi season. The mean rainfall gauged in the catchment of the tank at Dahyana and Sadgaon during the year was 19·92 inches against 25·01 inches, the average of the previous three years. The area irrigated, gross assessed revenue and working expenses during the year as compared with the average of the preceding three years are given below :—

Area irrigated.				Gross assessed revenue.		Working expenses.	
Patasthal.		Jirayat.					
1930-31.	Average	1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Acres.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1,236	1,467	1,419	1,140	27,865	26,897	4,198	9,367

SATARA DIVISION.

88. The area irrigated, gross assessed revenue and working expenses of the six works mentioned below, as compared with the average of the preceding three years, are given in the following statement :—

Name of work.	Area irrigated.		Gross assessed revenue.		Working expenses.	
	1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Krishna Canal ..	4,809	5,788	71,386	66,292	21,153	24,846
Rewari Canal ..	837	794	3,642	4,062	3,287	2,723
Upper Man River Works.	969	1,463	2,427	6,176	9,316	6,566
Yerla River Irrigation Works.	3,257	4,966	9,319	23,167	16,218	57,384
Chikhli Canal ..	390	398	1,283	2,153	2,458	1,724
Maini Tank ..	2,340	2,251	5,077	9,113	6,268	5,144

The decrease in the area irrigated on the Krishna Canal was due to less demand for canal water on account of timely and sufficient rainfall in the canal area in both the Kharif and Rabi seasons. The increase in gross assessed revenue was due to the increase in perennial irrigation owing to the good supply in the river during the hot season. The decrease in revenue on the Rewari Canal and the Maini Tank in spite of the increase in the area irrigated was due to the concession of half Rabi rates sanctioned by Government. The decrease in the area irrigated and the consequent decrease in the gross assessed revenue on the Upper Man River Works and the Yerla River Irrigation Works was due partly to timely and sufficient rainfall in both the Kharif and Rabi seasons and partly to the concessional water rates for the Rabi season sanctioned by Government.

KRISHNA CANAL.

89. The rainfall gauged at Retre Budruk, which is in the centre of the irrigated tract, was 23·63 inches against 23·92 inches, the average of the past three years. In the Monsoon and Rabi seasons, the rainfall was sufficient and well-distributed. There was an increase in perennial irrigation owing to sufficient supply in the river in the Hot season.

REWARI CANAL.

90. The rainfall gauged at Rewari, which is one mile below the bandhara, was 31·02 inches against 26·14 inches, the average of the past three years. In the Monsoon and Rabi seasons the rainfall was sufficient and well-distributed. The supply in the river in the months of April and May was low but it improved in June and the river was in flood in September. The supply was sufficient for Rabi crops and was distributed by rotation.

UPPER MAN RIVER WORKS.

(*Pingli Tank.*)

91. On 1st April, the level of water in Pingli Tank was at R. L. 2358·69, the corresponding contents being 23·44 million cubic feet. The supply was utilised for irrigating perennial crops. The first replenishment was received on 23rd May when the level of water stood at R. L. 2355·19 equivalent to 8·48 million cubic feet. The supply gradually fell to R. L. 2354·29 equivalent to 6·17 million cubic feet. The tank was dry on 5th July but a substantial replenishment was received on 7th September when the level of water rose to R. L. 2356·89, the corresponding contents being 14·3 million cubic feet. The supply available was utilised for irrigating Rabi crops. The rainfall gauged at Gondowla, which is about three miles below the tank, was 29·46 inches against 22·9 inches, the average of the past three years.

YERLA RIVER IRRIGATION WORKS.

(*Nehr Tank.*)

92. On 1st April, the level of water in the Nehr Tank was at R. L. 2654·59 which gradually decreased to R. L. 2652·49 on 22nd May. The first replenishment was received on 23rd May when the level rose to R. L. 2653·62, the corresponding contents being 127·43 million cubic feet. The level gradually rose thereafter. There were no high floods in the river during the year. The rainfall gauged at Khatgaon, which is about 4 miles below the tank, was 26·69 inches against 26·86 inches, the average of the past three years.

CHIKHLI CANAL.

93. On 1st April, the river was flowing with a depth of 2·5 feet and the canal flowed till 10th April. The supply was utilised for irrigating perennial crops. There was no water in the river on 5th May. The first replenishment was received on 6th May and the canal again flowed on 19th June. There were floods in the river and the maximum height

reached was 4 feet. The river continued to flow till 14th February. The rainfall gauged at Chikhli, which is at the centre of the canal tract, was 15·08 inches against 21·04 inches, the average of the past three years.

Maini Tank.

94. On 1st April, there was no water in the tank. The first replenishment was received on 6th May when the level of water rose to R. L. 2301·32, equivalent to 29·28 million cubic feet. No further replenishment was received till 3rd September. On 6th September, a large replenishment was received and raised the level of water to R. L. 2304·72 which was the highest level reached during the year. Water flowed over the waste-weir till 21st September. The supply was utilised for irrigating both Kharif and Rabi crops. The level gradually fell and the tank became dry on 9th January. The rainfall gauged at Maini was 20·23 inches against 25·17 inches, the average of the previous three years.

SOUTHERN CIRCLE.

BELGAUM DIVISION.

Gadikeri Tank.

95. There is no rain-gauge installed in the catchment of this tank. The lands under it are assessed at consolidated rates. The area irrigated and the irrigation share of revenue were 407 acres and Rs. 2,356 respectively and the working expenses amounted to Rs. 319.

Gokak Canal.

96. This canal is the most important irrigation work in the Southern Circle. The system consists of a reservoir formed by a masonry weir across the Ghataprabha river at Dhupdal in the Belgaum District, a short distance above the Gokak Falls, with 16 miles of main and branch canals and 36 miles of distributaries. The canal commands an area of 18,668 acres, the area irrigable being 17,627 acres. Though the storage is mainly intended for irrigating lands under the canal, a stipulated quantity of water is annually issued to the Gokak Mills Company in accordance with an agreement between Government and the Company, in consideration of which a sum of Rs. 14,313 is annually paid by the Company, subject to a rebate in the event of the supply falling short of that contracted for. During the year under report the Company had to be paid a rebate of Rs. 580, as the supply of water was short for a few days.

97. On 1st April, the level of water in the reservoir was 20·11 feet above the sill. It gradually fell to 16·7 feet on 30th April. Owing to replenishments, the water rose to 24·25 feet on 1st July. The temporary wooden crest was raised by four feet at the end of the monsoon. Owing to heavy rainfall in the catchment of the rivers, Ghataprabha and Hiranyakeshi, floods suddenly filled up the tank to the top of the temporary crest. They finally overtopped the crest by 15 inches on 10th October and washed away a length of 132 feet of the temporary wooden crest. Special repairs to the damaged portion were carried out immediately at a cost of Rs. 3,908. On account of heavy rains in November, there was

a good flow in the river and the tank was again filled to the top of the shuttering on 16th November. The draw-off for irrigation commenced from 26th November and at the end of that month the water level reached 25·99 feet. Supply of water to Maize and Rabi crops was stopped when the level came down to 24·08 feet on 15th February. On 31st March, the level of water was 21·1 feet. According to the sanctioned arrangement, water was supplied to the Madras and Southern Maratha Railway at the Hukeri Road Station for engines and passengers at the rate of Rs. 50 per month. The total amount recovered from the Railway Company during the year was Rs. 650, inclusive of Rs. 50 being the arrears of the previous year.

98. The following table gives information about the area irrigated and the results of revenue etc. as compared with the previous year :—

	1930-31.	1929-30.
Area irrigated ..	8,699 acres.	11,437 acres.
Irrigation assessment ..	Rs. 60,895	Rs. 78,339
Miscellaneous assessment ..	Rs. 18,578	Rs. 19,314
Gross assessment ..	Rs. 79,473	Rs. 97,653
Working expenses ..	Rs. 43,278	Rs. 17,865

The decrease both in area and assessment was partly due to timely rainfall and partly to the stoppage of water for Hot weather crops. The increase in working expenses was due to certain special repair works carried out during the year.

DHARWAR DIVISION.

Muchkundi Tank.

99. This tank depends entirely on local rains. Due to the precarious rainfall and the smallness of the catchment area, the supply in the tank is uncertain. On 1st April, the level of water in the tank was at R. L. 1791·67 or 5·75 feet above the sill of the outlet. The level went down gradually though there was rain from May to November to the extent of 11 inches and 47 cents. The highest level reached during the year was R. L. 1791·94. The level on 31st March was R. L. 1787·5. The area irrigated and the assessment thereon were 13 acres and Rs. 100 respectively against 22 acres and Rs. 172 of the previous year. The decrease both in area and revenue was due to less demand for water. The gross assessed revenue amounted to Rs. 2,184 and the working expenses to Rs. 1,601.

Dambal Tank.

100. The rainfall during the year was not favourable for irrigation. The lands under this tank are assessed partly at water rates and partly at consolidated rates. The total area irrigated and the irrigation assessment were 55 acres and Rs. 278 respectively against 335 acres and Rs. 1,606 of the previous year. The heavy decrease in area and assessment was due to scanty rainfall, no applications for the Rabi season having been entertained on that account. The area irrigated under the consolidated assessment and the irrigation share of revenue were 143 acres and Rs. 916 respectively. The total assessed revenue amounted to Rs. 2,349 and the working expenses to Rs. 568,

Medleri Tank.

101. On 1st April, the level of water in the tank was R. L. 170·85 or 5·85 feet above the sill of the outlet. The first replenishment was received on 25th May and the maximum level reached during the year was R. L. 180, the level on 31st March being R. L. 172·45 or 7·45 feet above the sill of the outlet. The area irrigated and the assessment thereon were 42 acres and Rs. 485 respectively against 60 acres and Rs. 590, the average of the last 3 years. The decrease was due to timely and sufficient rainfall and consequent less demand for tank water. The gross assessed revenue amounted to Rs. 708 against Rs. 868 of the previous year and the working expenses to Rs. 764.

Madag Tank.

102. On 1st April, the level of water in the tank was 0·89 foot above the sill of the outlet. The first replenishment was received on 29th July and the tank filled to the full supply level of R. L. 1877·71. The waste weir overflowed from 30th July to 24th January. The highest level reached was 4·85 feet above the crest of the waste weir. On 31st March, the level of water was 1·22 feet above the sill of the outlet. The area irrigated and the assessment thereon were 419 acres and Rs. 1,991 respectively as compared with 435 acres and Rs. 2,067, the average of the previous three years. The total assessed revenue amounted to Rs. 2,562 against Rs. 2,635, the average of the last 3 years, and the working expenses amounted to Rs. 2,133.

Asundi Tank.

103. The rainfall during the year was unfavourable and there was no demand for irrigation water in the Kharif season. The lands under this tank are assessed partly at water rates and partly at consolidated rates. The area irrigated and the irrigation assessment were 24 acres and Rs. 179 respectively against 35 acres and Rs. 1,469, the average of the previous three years. The heavy decrease in revenue was due to unfavourable monsoon resulting in the failure of revenue for the Kharif season. The area under consolidated assessment was 190 acres and the irrigation share of land revenue amounted to Rs. 686. The gross assessed revenue amounted to Rs. 1,710 against Rs. 1,443 of the previous year. The increase in revenue was due to the increase in miscellaneous receipts. The working expenses were Rs. 965.

Dharma Canal.

104. This canal is fed by the Dharma river. Water was admitted into the canal on 25th June and the canal flowed till the first watering was given. There was a break in the rainfall in August and September, but the late rains of October and November helped the 2nd watering to a great extent. The lands are assessed partly at water rates and partly at consolidated rates. The area irrigated and the irrigation assessment thereon were 451 acres and Rs. 2,610 respectively against 496 acres and Rs. 3,276 of the previous year. The area irrigated under consolidated assessment was 5,227 acres and the irrigation share of revenue amounted

to Rs. 24,208. The total assessed revenue (after deducting Rs. 23,156 to be credited to the old work) amounted to Rs. 3,666 and the working expenses to Rs. 1,247.

KANARA DIVISION.

MAVINKOP TANK.

105. The management of this tank, though it is a first class irrigation work, has been handed over to the Revenue Department. The area under this tank is assessed at consolidated rates. The area irrigated and the irrigation share of revenue during the year were 412 acres and Rs. 1,297 respectively against 415 acres and Rs. 1,403 of the previous year. The working expenses amounted to Rs. 590 against Rs. 277 of the previous year. The increase was due to the execution of special repairs to the tank at a cost of Rs. 200.

106. The following statement gives the rainfall during the year gauged at the sites of the works as compared with the average rainfall of the previous ten years :—

—	Dharma Canal.	Muchkundi Tank.	Dambal Tank.	Medleri Tank.	Madag Tank.	Asundi Tank.	Gokak Canal (Dhupdal).
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Kharif ..	55·04	6·01	6·05	7·41	14·55	10·5	9·3
Rabi ..	7·95	5·31	4·6	15·62	5·4	9·65	10·98
Total ..	62·99	11·32	10·65	23·03	19·95	20·15	20·28
Average of the last ten years ..	79·62	10·96	13·39	16·58	23·57	19·92	16·82

SECTION II.

COMPRISING IRRIGATION WORKS FOR WHICH NEITHER CAPITAL NOR REVENUE ACCOUNTS ARE KEPT.

GENERAL REMARKS.

107. The area of irrigation under, and revenue due from works (for which neither capital nor revenue accounts are kept) in the Deccan and Gujarat as recorded in the register of these works were 283,549 acres and Rs. 9,22,024 respectively. The following tables give by Districts, details of the area irrigated, expenditure, revenue, etc., in respect of irrigation works on which expenditure was incurred during the year :—

TABLE I.

Showing the area irrigated in the different Districts in the Deccan and Gujarat and the consolidated land revenue and water rates assessed and recovered during the year 1930-31 *in respect of irrigation works (for which neither capital nor revenue accounts are kept) on which expenditure was incurred during the year.*

Collectorate.	Number of works.	Area irrigated.	Revenue.			Remarks.
			Irrigation share.	Land share.	Total.	
		Acres.	Rs.	Rs.	Rs.	
Ahmedabad ..	21	269	(A) 260	1,793	2,053	(A) Includes Rs. 126 on account of "Direct receipts-Water rates."
Kaira ..	20	7,406	(B) 15,151	21,622	36,773	(B) Includes Rs. 3,998 on account of "Direct receipts-Water rates."
Panch Mahals ..	19	1,642	(C) 3,886	1,436	5,322	(C) Includes Rs. 3,197 on account of "Direct receipts-Water rates."
Surat ..	22	1,071	2,566	10,461	13,027	(D) Includes Rs. 2,016 on account of "Direct receipts-Water rates."
Broach ..	3	85	152	432	584	(E) Includes Rs. 3,088 on account of "Direct receipts-Water rates."
East Khandesh ..	1	129	1,043	481	1,524	(F) Water rate direct receipts.
						(G) Water rate direct receipts.
West Khandesh..	2	465	(D) 3,374	147	3,521	(H) Water rate direct receipts.
Nasik ..	69	5,411	(E) 51,671	10,912	62,583	
Poona ..	1	176	(F) 882	..	882	
Sholapur ..	3	610	(G) 4,866	..	4,866	
Belgaum ..	38	3,942	17,598	4,325	21,923	
Dharwar ..	67	6,069	21,090	5,272	26,362	
Kanara ..	30	2,783	6,956	1,739	8,695	
Bijapur ..	3	273	1,189	430	1,619	
Ratnagiri ..	1	211	827	..	827	
Ahmednagar ..	2	3,654	(H) 13,941	..	13,941	
Total ..	302	34,196	1,45,452	59,050	2,04,502	

TABLE

Showing actual expenditure and receipts for the year 1930-31 *on the revenue accounts are kept) on which*

Collectorate.	Expenditure.						
	Direct charges.						
	Extensions and improvements.	Maintenance and repairs.	Establishment.	Tools and Plant.	Total.	Share of collection charges.	Grand Total.
1	2	3	4	5	6	7	8
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Ahmedabad ..	4,198	15,897				26	
Kaira	2,100	17,501	20,490	600	75,391	1,515	77,211
Panch Mahals ..	2,660	11,945				279	
Surat	..	13,355				1,067	
			6,940	239	21,846		22,928
Broach	..	1,312				15	
West Khandesh ..	..	526				176	
			698	38	1,647		1,927
East Khandesh ..	..	385				104	
	Works						
Ahmednagar ..	60,029	17,221	33,508	2,460	1,13,218	279	1,13,497
Nasik	2,020	39,995	20,697	466	63,178	4,920	68,098
	Works						
Poona	18,834	6,174	74,686	914	1,00,633	18	1,00,651
	25						
Sholapur ..	..	2,014	817	83	2,914	107	3,021
Belgaum	67	15,356				1,760	
Dharwar ..	6,430	34,165				2,119	
Kanara	1,843	20,600	33,294	1,420	1,17,040	696	1,21,817
Bijapur	..	645				119	
Ratnagiri ..	..	3,220				83	
Thana	..	70	25	1	96	..	96
Total ..	98,206	2,00,381	1,91,155	6,221	4,95,963	13,283	5,09,246

II.

irrigation works in the Deccan and Gujarat (for which neither Capital nor expenditure was incurred during the year.

Actual Receipts.						
Direct Receipts.			Indirect receipts—Share of consolidated revenue.	Grand total, direct and indirect receipts.	Refunds of revenue.	Gross receipts less refunds.
Water rates from irrigation.	Miscellaneous.	Total direct receipts.				
9	10	11	12	13	14	15
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
126	468	594	134	728	....	728
3,998	3,448	7,446	11,153	18,599	....	18,599
3,197	1,231	4,428	689	5,117	....	5,117
....	8,153	8,153	2,566	10,719	....	10,719
....	..	....	152	152	....	152
2,016	12	2,028	1,358	3,386	....	3,386
....	..	....	1,043	1,043	....	1,043
13,941	5,150	19,091	....	19,091	35	19,056
3,088	1,471	4,559	48,583	53,142	63	53,079
882	29	911	....	911	....	911
4,866	2,018	6,884	....	6,884	....	6,884
....	8	8	17,598	17,606	....	17,606
....	108	108	21,090	21,198	....	21,198
....	..	....	6,956	6,956	....	6,956
....	10	10	1,189	1,199	....	1,199
....	..	....	827	827	....	827
....	..	....	....	....	....	....
32,114	22,106	54,220	1,13,338	1,67,558	98	1,67,460

DETAILED REPORTS BY LOCAL OFFICERS.

NORTHERN CIRCLE.

AHMEDABAD, KAIRA AND PANCH MAHALS AND SURAT AND BROACH DIVISIONS.

KHARI SLUICES.

108. There were 4 floods during the year in the Khari river at Pinglaj, the head of the Khari Sluices system, on 4th, 7th and 23rd July and 7th August, their discharges being 126, 184, 436 and 520 cusecs respectively. The flood of the 23rd July caused the river to overflow its banks and the flood water reached the Goblaj tank and also the Naika and the Bherai reservoirs which were filled on the 15th August. The Kalambandhi rotation of 20 days which was commenced from 1st September continued till the end of November when the rice crop was matured. Out of the Himayat paying area of 7,238 acres, the area protected and cropped was 4,940 acres. A non-Himayat paying area of about 517 acres was also irrigated and brought to maturity. The Khari Sluices including the Goblaj tank and the Bherai and the Naika reservoirs were maintained at a cost of Rs. 5,196. A sum of Rs. 1,514 was also spent in clearing silt from the bed of the Khari river. The miscellaneous revenue under the Khari Sluices system amounted to Rs. 522 against Rs. 369 of the previous year. The following table compares the area irrigated and the revenue obtained with the average of the previous three years :—

	Average.		1930-31.	
	Area irrigated.	Revenue after deducting remissions.	Area irrigated.	*Revenue after deducting remissions.
	Acres	Rs.	Acres	Rs.
Irrigation above the Kalambandhi villages	556	3,093	537	1,631
Irrigation from tanks fed by the Khari river—(Goblaj)	417	1,849	1,076	1,179
(Galki)	87	692	505	18†
Irrigation from the Khari Sluices in the 11 Kalambandhi villages	6,432	38,467	6,433	32,775
Total ..	7,492	44,101	8,551	35,603

* The revenue is consolidated.

† The water rates remained unrealised during the year.

109. The assessment under the Khari Sluices in the Kalambandhi villages is consolidated. The average rates per acre for land and water worked out during the year as under :—

	Irrigation share.	Land share.	Total consolidated.
	Rs. a. p.	Rs. a. p.	Rs. a. p.
Government land	0 5 6	5 2 4	5 7 10
Alienated land	0 1 9	1 9 11	1 11 8

Muvalia Tank.

110. This is an important tank situated near Dohad town, having a catchment area of about 39 square miles of hilly tract. It fills in years of normal rainfall. During the year under report, it filled to its full capacity owing to good rainfall, which was 33·56 inches against 30·57 inches, the average of the previous three years. The area irrigated was 731 acres, the assessment thereon being Rs. 2,332. The miscellaneous revenue realised amounted to Rs. 412 against Rs. 340 of the previous year. The work of providing flat brick lining to the right bank canal of the tank was completed during the year at a cost of Rs. 1,194. The tank with its dam, canals and distributaries was maintained at a cost of Rs. 4,450.

Old Tanks.

111. Improvements to 1 tank in the Ahmedabad and 4 tanks in the Kaira and Panch Mahals Divisions and repairs to 6 tanks in the Ahmedabad, 16 tanks in the Kaira and Panch Mahals and 34 tanks in the Surat and Broach Divisions were carried out at a total cost of Rs. 3,559 and Rs. 32,374 respectively. The area irrigated and revenue derived from the old irrigation tanks and bunds were as under :—

Name of Collectorate.	Area irrigated.	Revenue.		
		Irrigation share.	Land share.	Total consolidated assessment.
	Acres	Rs.	Rs.	Rs.
Ahmedabad	10,126	10,446	44,492	54,498
Kaira	2,422	3,004	7,648	10,652
Panch Mahals	270	689	1,436	2,125
Surat	2,402	4,956	24,831	29,788
Broach	809	1,519	4,963	6,482
Total ..	16,029	20,614	83,370	1,03,545

112. The work of constructing the Warod Sapoy tank in Jhalod Mahal was in progress and the outlay during the year was Rs. 1,399. The drainage channels in the Ahmedabad, Kaira and Panch Mahals and Surat

and Broach Divisions were maintained at a cost of Rs. 8,616, Rs. 4,145 and Rs. 5,184 respectively. The protective and reclamation works in the Surat and Broach Division were maintained at a total cost of Rs. 8,330.

DECCAN IRRIGATION CIRCLE.

MUTHA CANALS DIVISION.

KHAMGAON TANK.

113. This partially completed famine tank received replenishment due to local rain in the monsoon. The available supply was issued for irrigating 138 acres which brought in a gross assessed revenue of Rs. 451, the corresponding figures for the previous year being 181 acres and Rs. 918. The maintenance and repair charges on the tank amounted to Rs. 398.

BANDHARAS.

114. The sub-joined table gives the area irrigated and the revenue assessed from the irrigation works in the Poona Collectorate during the year as compared with the average of the past three years :—

	Area irrigated.	Consolidated revenue.		
		Irrigation share.	Land share.	Total.
	Acres.	Rs.	Rs.	Rs.
1930-31	2,703	13,517	4,942	18,459
Average	1,572	8,867	3,182	12,049

The expenditure incurred on these works during the year amounted to Rs. 1,237.

NASIK IRRIGATION DIVISION.

KHIRDI SATHE TANK.

115. The management of this small tank was taken over by this Department in 1917. It was dry from 14th February to 8th June when replenishment commenced. The level of water in the tank gradually rose to 9·7 feet above the sill on 26th June, the contents then being 21·5 million cubic feet against the designed storage of 91·05 million cubic feet. The draw-off for irrigation commenced on 17th October. The level again gradually rose to 16·7 feet above the sill on 6th November on account of late rains, the contents then being 61·54 million cubic feet. On 31st March, the level was 8·8 feet above the sill, the contents being 18·26 million cubic feet. The maintenance and repair charges on the work amounted to Rs. 513. The area irrigated during the year was 314 acres, which brought in an irrigation and gross assessed revenue of Rs. 788 and Rs. 960 respectively, the corresponding figures for the previous year being 942 acres and Rs. 3,806 and Rs. 4,120. The decrease in the area irrigated and assessment was due to lack of water in the tank in the kharif season and lack of demand for water in the rabi season.

BANDHARAS.

116. These works consist of numerous small weirs built across streams with good supply of water to raise the level of water sufficiently to command the land to be irrigated. There are 296 such works in the Nasik Collectorate. Out of them 36 were repaired during the year at a cost of Rs. 27,739. The supply to the bandharas was generally good owing to timely rainfall. The subjoined table compares the year's results as regards the area irrigated and the revenue assessed with the average of the past three years :—

—	Area irrigated.	Consolidated revenue.		
		Irrigation share.	Land share.	Total.
	Acres.	Rs.	Rs.	Rs.
1930-31	28,554	1,95,569	52,267	2,47,836
Average	27,463	1,92,981	53,903	2,46,884

The remissions granted during the year amounted to Rs. 6,881.

AHMEDNAGAR DIVISION.

VISAPUR TANK.

117. The Visapur Tank Dam across the Hanga river, a tributary of the Bhima, was started as a famine relief work in 1896 and was subsequently completed by slow stages to provide employment for the Criminal Tribes and Convict labour which was supplemented by ordinary labour. This earthen dam which is 7,440 feet long and 84 feet high above the river bed forms a lake with a capacity of 1,136 million cubic feet, the catchment area being 159 square miles. It was completed in June 1927. Out of the estimated cost of Rs. 41 lakhs for the whole scheme, Rs. 21 lakhs were spent on the dam and head-works and the balance on the construction of the canal, its distributaries and minors. The total length of the main canal, distributaries and minor channels is 46 miles. The area under command is 95,000 acres of which 26,000 acres are irrigable, the irrigation capacity of the tank being 13,000 acres. Irrigation was first started in the rabi season of 1929-30.

118. The tank received its first replenishment on 8th June. The full supply level, which is at R. L. 2068, was reached on 13th September. The highest level reached was R. L. 2068·85 on 2nd November. Water was issued for irrigation of rabi crops and the level gradually went down to R. L. 2063 on 15th February. The area irrigated during the year and the irrigation assessment amounted to 3,654 acres and Rs. 10,759 respectively as compared with 3,899 acres and Rs. 13,693 of the previous year. The decrease in the area irrigated and the assessment was due

to less demand for rabi water on account of satisfactory local rains. The maintenance and repair charges during the year amounted to Rs. 14,277.

KHUNTEPHAL TANK.

119. This is a very small tank with a capacity of about 57 million cubic feet and is situated on a small nala about 45 miles from Ahmednagar. It is entirely dependent on local rain for its supply. It had dried up on 2nd February and received first replenishment on 20th June. The full supply level of R. L. 123 was reached on 4th November, the contents then being 57·32 million cubic feet. The maintenance and repair charges amounted to Rs. 2,944 and in addition Rs. 721 were spent on constructing a tail channel. Due to very good rains there was no demand for water both in the kharif and rabi seasons and no irrigation was therefore done from the tank. The total receipts including irrigation rates amounted to Rs. 649.

CENTRAL CIRCLE.

120. The area irrigated and the gross assessed revenue on the small tanks were 931 acres and Rs. 4,122 respectively, while those on the bandharas and channels in the Khandesh Division were 8,669 acres and Rs. 65,111 respectively.

SHOLAPUR DIVISION.

WADSHIVNE TANK.

121. On 1st April, the level of water in the tank was 8·27 feet over the sill of the outlet. The level gradually went down to 5·87 feet on 15th June. With the rainfall of 5·66 inches in June, the tank received a replenishment of 3 feet which was utilised for both kharif and rabi irrigation to the extent of 120 and 489 acres respectively. The mean rainfall gauged at two stations in the catchment area of the tank (14·5 square miles) was 16·21 inches against 23·52 inches, the average of the preceding three years. The total replenishment received was 63·63 million cubic feet. The area irrigated during the year was 610 acres against 894 acres, the average of the last three years. The decrease was due to less demand for water in the rabi season on account of the timely rainfall. The gross assessed revenue amounted to Rs. 2,094 against Rs. 4,135, the average of the preceding three years. The expenditure on maintenance and repairs amounted to Rs. 1,381 against Rs. 1,377, the average of the past three years.

KHANDESH DIVISION.

TALWADA TANK.

122. The supply in this tank is generally uncertain. The year commenced with a storage of 30·23 million cubic feet, which gradually went down to 17·4 million cubic feet. The first replenishment was received on 20th June which raised the storage to 22·36 million cubic feet. The maximum storage reached was 39·15 million cubic feet on 15th September and the supply was utilised in meeting the demands in both the kharif and rabi seasons. The tank went dry on 31st March. The

rainfall gauged during the year was 19·33 inches against 17·36 inches, the average of the previous three years. The area irrigated was 321 acres and the gross assessed revenue amounted to Rs. 1,748. The revenue realised from water rates during the year amounted to Rs. 2,016, the miscellaneous realisations being Rs. 12. The expenditure incurred on the maintenance and repairs to the tank and canal was Rs. 500.

Old Works.

123. The old bandharas and channels are grouped as under :—

1. The Upper Panjhara River Group, including the Gondur Tank.
2. The Kan River Group.
3. The Burai River Group.
4. The Girna River Group.
5. The Bori River Group.

The area irrigated and the revenue derived from these works during the year as compared with the average of the preceding three years are shown in the following table :—

Area irrigated.		Revenue.					
		Irrigation share.		Land share.		Total.	
1930-31.	Average.	1930-31.	Average.	1930-31.	Average.	1930-31.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
8,669	9,989	65,111	60,741	13,257	12,760	78,368	73,501

The expenditure incurred on repairs to these works during the year amounted to Rs. 399. An expenditure of Rs. 947 was also incurred on river and rain gauge operations.

SATARA DIVISION.

Borgaon Dam.

124. The total area irrigated during the year was 105 acres and the consolidated assessment was Rs. 563. The irrigation share of the revenue amounted to Rs. 338 and the balance of Rs. 225 represented the land assessment.

SOUTHERN CIRCLE.

BELGAUM DIVISION.

125. There are about 540 second class irrigation works in this Division. Repairs to 40 tanks were done during the year at a cost of Rs. 18,630. The area irrigated was 13,803 acres, and the irrigation share of revenue amounted to Rs. 57,863.

DHARWAR DIVISION.

126. This division contains about 1,744 tanks. During the year, an expenditure of Rs. 35,642 was incurred on repairs to 69 tanks and a sum of Rs. 2,575 was spent on extensions and improvements. The area irrigated was 49,865 acres and the irrigation share of revenue after deducting remissions (Rs. 61,430) amounted to Rs. 1,26,354. The total direct and indirect receipts were Rs. 1,27,765, the working expenses being Rs. 1,07,952.

KANARA DIVISION.

127. The second class tanks in this division number about 2,128 and are situated at scattered places. During the year a sum of Rs. 15,232 was spent on repairs to 30 tanks. The area irrigated was 27,413 acres and the irrigation share of revenue amounted to Rs. 81,416.

RATNAGIRI DIVISION.

128. There are only three tanks in Malwan Taluka of the Ratnagiri Collectorate which are in charge of this division. An expenditure of Rs. 62 was incurred on special repairs to one of the tanks. The gross assessed revenue was Rs. 827 and the same amount was realised during the year.

SECTION III.

IRRIGATION DEVELOPMENT AND RESEARCH CIRCLE.

SPECIAL IRRIGATION DIVISION.

129. In the Deccan when a large perennial canal is opened, widespread water-logging is liable to ensue due to percolation. Some of this water-logging dries out later, but the area of damage extends rapidly into the valleys, and unless steps are taken to set matters right, the later damage, consisting mainly of salt-efflorescence, becomes permanent. The seriousness of the menace was realised as early as 1888 and the controversy regarding the relative effect of channel losses and wasteful irrigation and the best methods to adopt to safeguard the land became yearly more acute. Various experiments were carried out at the instance of the Agricultural Department but by 1913 it was clear that all the methods tried had failed. It was eventually decided to open a Special Irrigation Division to investigate the question of canal development, especially as regards safeguarding the soil. In June 1916 the Division was formed and the work entrusted to it was " to contour the commanded area, make a careful survey and classification of the surface and sub-soil, select and mark out definite areas suitable for 'blocks' for perennial and other crops, design the drainage required, indicate suitable lines of communication, and centres for the establishment of crushing, grinding, refining and other machinery for trade purposes, and to make a study of the reclamation of waste lands and areas damaged by water-logging and salt-efflorescence and the growth of useful timber in such tracts and along the main canal". In short, research and investigation into all the problems relating to irrigation by actual experiment has been the sphere of work of this Division. The investigations coming within this sphere may be broadly grouped under 5 heads, viz. (*a*) irrigation, (*b*) irriculture or the interaction of irrigation and agriculture, (c) soil physics, (*d*) drainage and reclamation and (*e*) hydrodynamic research. The results of the more important of these investigations are published in Technical Papers from time to time.

130. The work done in the Division during the year under report may be classified under (1) soil survey and classification, (2) observation of sub-soil water levels, (3) drainage of lands damaged by water-logging and salt efflorescence, (4) formation and revision of blocks, (5) effluent irrigation, (6) irriculture at the Effluent Farm, (7) Baramati experimental salt area, (8) soil physical work, (9) river gauging, and (10) hydrodynamic research. A brief account of the work done during the year under these heads is given below :—

(1) SOIL SURVEY AND CLASSIFICATION.

Nira Right Bank Canal.—Corrections in coarse soil areas and in demarcating 1½′ M.I.B'.s* and 8′ M.I.B.'s in Malsiras Section were continued during the year. Demarcation of damaged areas on the canal was completed as usual.

* Muram Iso-baths.

Nira Left Bank Canal.—Accurate demarcation of 12", 15" and 18" M.I.B.'s on the canal to facilitate the revision of perennial blocks was completed up to Distributary No. 35 and the remaining portion was taken in hand. Periodical demarcation of damaged area on the canal was also taken in hand.

Godavari Canals.—The work of demarcating 12", 15" and 18" M.I.B.'s was started for the collection of data for the impending block revision of the canals. The work on the Godavari Left Bank Canal was finished and covered an area of 19,000 acres, while that on the Right Bank Canal was taken in hand.

Several applications for allowing the cultivation of perennials within the quarter mile limit of villages were received. Areas around 100 villages scattered over all the major canals in the Deccan Irrigation Circle were inspected to ascertain the suitability or otherwise of individual survey Nos. for exemption from the operation of the quarter mile limit rule.

(2) Observation of Sub-soil Water Levels.

The well-observation work is being carried out with the help of special establishment on the Godavari Canals, Pravara Canals, Nira Right Bank Canal and the Nira Left Bank Canal. The results of these observations are of great use for ascertaining whether the sub-soil water level in any particular area is rising to within the danger limit and for deciding the suitability of lands for perennial blocks in the final soil classification.

(3) Drainage of Lands damaged by Water-logging and Salt-efflorescence.

A Technical Paper on " Land Drainage in the Deccan Canals Areas " dealing with preparation, execution and maintenance of drainage schemes was revised and brought up-to-date for publication. Experiments were in progress in connection with the durability of pipes in salt-affected lands. The drainage schemes under execution and the expenditure incurred on them during the year were :—

	Rs.
Nira Left Bank Canal.	
Hol Murum Karanja Drainage Scheme ..	8,080
Malegaon Drainage Scheme	854
Distributary 26-C Drainage Scheme ..	1,002
Godavari Canals.	
Kopargaon Drainage Scheme, Godavari Left Bank Canal	620
Nimgaon Shirdi Drainage Scheme, Godavari Right Bank Canal	10,939
Culvert 29 (Godavari Right Bank Canal) Drainage Scheme	165
Pravara Canals.	
Nandur Khandala Drainage Scheme ..	1,865
Mutha Right Bank Canal.	
Manjri Drainage Scheme	17,296

The total expenditure on all the drainage works during 1930-31 amounted to Rs. 39,581 against Rs. 42,686 in the previous year. In addition to these a number of schemes were under preparation.

(4) Formation and Revision of Blocks.

The total applications for blocks for 1931–37 on the Nira Left Bank Canal were for 25,747 acres of which 20,606 acres were sanctioned. On the Nira Right Bank Canal the area applied for 1931–36 was 1,610 acres of which 1,038 acres were already measured and the measurement of the remainder was in progress. The total block area during the year on the Godavari Canals was 12,986 acres, while on the Pravara Canals it was 10,365 acres.

(5) Effluent Irrigation.

The disposal of sewage from Poona city by mixing it with canal water and using the mixture for irrigation was started on Distributary No. 5 of the Mutha Right Bank Canal in 1916 and has been very successful. The pumping of effluent from the new pumping station near Mundhava (started in August 1929) continued as usual. The area between Distributary No. 3 and Outlet No. 22 was taken over from the Executive Engineer, Mutha Canals Division, in November 1930 for extension of effluent irrigation. The average discharge of effluent pumped during the year (15th February 1930 to 14th February 1931) was 5·60 year-cusecs of which 5·17 cusecs were utilised for irrigation and the remaining 0·43 of a cusec was disposed of on fallow land during the cold weather. The average "N" content in effluent was 3·72 parts per 100,000 parts of effluent by weight. The gross assessed effluent revenue during the year was Rs. 89,738. The cane area under effluent during the year was 697 acres of normal plantation and 64 acres of June-October plantation (adsali). Areas of 113 acres of other perennials and 19 acres of seasonal crops were also irrigated on effluent.

(6) Irriculture at the Effluent Farm.

The main object of opening this Farm was to conduct experiments in connection with the disposal of effluent and to establish its value as a manure for crops grown in the Mutha valley. Later, when land became available, some important experiments connected with irriculture were taken up. Both these series of experiments are being continued to date. The total area of the farm is 63 acres, of which 54 acres are under cultivation, the rest being occupied by buildings, roads and water channels. The actual expenditure in running the Farm during the year was Rs. 15,310 and the receipts realised from all sources were Rs. 11,755. The expenditure includes Rs. 1,600 for an oil engine installed on the Farm. The low receipts are due to very low rates for gul which is the chief source of revenue. The following experiments were continued during the year under report :—

(1) Dose experiments.
(2) Coarse manure series.
(3) Varieties.

(4) Interval experiments—
(*a*) 8, 10, 12, 15 days' interval throughout the year.
(*b*) Regular and irregular rotations.
(*c*) 8 days' in hot weather and 12 days' during the rest of the year
(5) Water quantity experiments.
(6) Water-cum-manure experiments.
(7) Seasonal plantation.
(8) Treble green manuring.

(7) Baramati Experimental Salt Area.

The object of acquiring this area which was of the worst type, the soil being highly salt-affected and extremely bad as regards its physical condition, was to have an experimental station to find out methods of reclamation. The total area acquired is 160 acres and 30 gunthas. Of these, 106 acres are nearly reclaimed and are under cultivation and 21 acres and 26 gunthas are under Babul trees, a natural method of reclamation. The remaining area is to be reclaimed and the work is in progress. The actual expenditure in running the Farm during the year was Rs. 21,936 and the receipts were Rs. 12,200. The expenditure includes Rs. 4,000 spent on the erection of a crushing plant and engine and crusher shed. The receipt figure would have been higher had it not been for the all round slump in the market prices of agricultural produce. The system of reclamation by agricultural methods is as follows :—

(*a*) Flooding with protection of shallow trenches, i.e. leaching out salts.

(*b*) Growing a test crop of Shalu after flooding.

(*c*) Growing a San green manure crop during the monsoon after flooding.

(*d*) Addition of organic manures to improve the physical condition of soil.

The work of reclamation is lengthy when the physical condition of the soil is bad. In the case of simple water-logged areas, the work is easy and can be completed within two years.

(8) Soil Physical Work.

Work of the Effluent Research Laboratory.—Besides the routine work of analysing effluent samples (to calculate the amount of nitrogen given to sugarcane in different experiments on the Farm and to calculate the dose of nitrogen given to cultivators), the following problems were investigated :—

(1) Electrical method to determine nitrogen in effluent.

(2) Periodical estimations of N, K and P in effluent.

(3) Studying the effect of effluent on the chemical and mechanical composition of the soil.

(4) Loss of nitrogen in effluent in transit.

(5) Morphological observations of growth of sugarcane.

(6) Transpiration experiments.

(7) Constitution of drainage water from sugarcane plots.

Experimental work at Baramati.—The following experiments were conducted at the Physical Laboratory :—

(1) Experiments on the flow of water through soils packed to various lengths in tubes of 3″ diameter.

(2) Experiment to ascertain whether the depth of water penetration is more rapid under conditions of.

(*a*) flooding or .

(*b*) light intermittent irrigation.

(3) Soil improvement experiments.

(4) Pipe testing experiment.

(9) River Gauging.

The gauging of the river Mula at Chikalthan was continued during the year. As there is no chance of the project connected with this gauging being taken in hand in the near future owing to financial stringency, further gauging has been stopped.

(10) Hydrodynamic Research.

Experiments in connection with the following subjects were conducted during the year :—

(*a*) Silt control experiments with part Barrage Models at Distributary No. 5 and Khadakvasla.

(*b*) Flume Fall experiments with baffles.

(*c*) Experiments with the Rohri Fall Models at Distributary No. 5 and Khadakvasla.

(*d*) Experiments with Gibb Modules at Distributary No. 5.

STATEMENT

Statement of Area irrigated by Irrigation Works in the Bombay

No.	Name of work.	Area irrigated.					Double cropped.	
		Kharif.	Rabi.	Total	Flow.	Lift.	Area irrigated.	Percentage of total area.
1	2	3	4	5	6	7	8	9
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
	PRODUCTIVE.							
	Southern Circle.							
1	Gadikeri Tank	*407	..	*407	407	..	..	..
2	Mavinkop Tank	*412	..	*412	412	..	..	..
	Central Circle.							
3	Ekruk Tank	282	3,717	3,999	3,928	71	..	..
4	Shahada Channel	*681 166	314* 372	995* 538	1,533	..	265	17
	Total, Productive ..	448 *1,500	4,089 *314	4,537 *1,814	6,280	71	265	4·17
	UNPRODUCTIVE.							
	Northern Circle.							
5	Hathmati and Khari Cut Canals ..	9,954	1,151	11,105	7,943	3,162	..	..
6	Wangroli Tank	1,762	189	1,951	1,892	59	..	..
7	Savli Tank	2,216	..	2,216	2,195	21	..	..
8	Saiat Tank	915	56	971	966	5	..	..
9	Tranza-Nagrama Tanks	..	..	..	..	..	..	..
10	Futelao Tank	..	86	86	86	..	..	..
	Irrigation Development and Research Circle.							
11	Nira Left Bank Canal .. .	(27,787) 36,766	(43,780) 23,137	59,903	59,750	153	8,114	13·55
	Shetphal Tank	(3,620) 4,446	(3,647) 1,594	6,040	6,040	..	845	13·99
	Deccan Irrigation Circle							
12	Nira Right Bank Canal	(5,812) 5,965	(10,765) 12,929	18,894	18,889	5	32	0·17
13	Mhaswad Tank	(1,195) 1,391	(1,929) 2,168	3,559	3,559	..	..	..
14	Mutha Canals	(9,883) 10,675	(667) 1,011	11,686 ‡29	11,518	168	16	0·14
	Matoba Tank	(849) 921	(1,747) 2,030	2,951	2,951	..	19	0·64
15	Kasurdi Tank	(8) 9	(53) 56	65	65	..	..	..
16	Shirsuphal Tank	(437) 480	(589) 683	1,163	1,159	4	17	1·46
17	Bhadalwadi Tank	(189 207	(659) 1,230	1,437	1,437	..	7	0·48

I-E.

Presidency, excluding Sind, during the year 1930-31.

Average discharges, cubic feet per second.				Area irrigated per cubic foot per second.				Base to which the duties of water are calculated.	
At Head.		Utilized.		Discharged at Head.		Utilized.		Kharif.	Rabi.
Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
10	11	12	13	14	15	16	17	18	19
				Acres.	Acres.	Acres.	Acres.		
..	..	..	..	..	..	..	..	16th January to 15th October.	16th October to 15th January.
..	..	..	..	..	..	..	..	Do.	Do.
8·20	19·73	2·90	14·31	0·34	190	97	262	15th February to 14th October.	15th October to 14th February.
4·46	12·37	4·46	12·37	190	55	190	55	15th June to 14th October.	15th October to 14th February.
..	..	..	..	..	..	..	..		
†177 78	25	†75 78	25	6·57 112·70	45·88 ..	15·51 112·70	45·88 ..	15th June to 15th November.	16th November to 14th February.
81·74	14·99	81·74	14·99	21·55	12·66	21·55	12·66		
158·22	..	158·22	..	14·00	..	14·00	..		
100·12	2·63	100·12	2·63	9·13	21·29	9·13	21·29	15th June to 14th November.	15th November to 14th February.
..	..	..	..	..	..	..	..		
..	7·06	..	7·06	..	12·18	..	12·18		
(*b*)440	(*b*)378	(*b*)371	(*b*)323	63	116	75	136	15th February to 14th October.	15th October to 14th February.
35	32	35	32	(*g*)103	(*g*)114	(*g*)103	(*g*)114		
432	535	..	..	(*f*)	(*f*)	(*f*)	(*f*)	15th February to 14th October.	15th October to 14th February.
33	61	33	61	(*c*)36	(*c*)32	(*c*)36	(*c*)32	Do.	Do.
192	124	(*h*)	(*h*)	(*i*)51	(*i*)5	(*h*)	(*h*)	Do.	Do.
10	12	10	12	85	146	85	146	15th June to 14th October.	Do.
..	..	..	..	..	..	..	..	Do.	Do.
(*j*) 3	4	3	4	146	147	146	147	Do.	Do.
2	3	2	3	94	220	94	220	Do.	Do.

STATEMENT

No.	Name of work.	Area irrigated.					Double cropped.	
		Kharif.	Rabi.	Total.	Flow.	Lift.	Area irrigated.	Percentage of total area.
1	2	3	4	5	6	7	8	9
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*contd.*	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
	UNPRODUCTIVE—*contd.*							
	Deccan Irrigation Circle—contd.							
	Lake Beale—Darna Dam	378	184	(b)562	..	562	..	..
18	Godavari Right Bank Canal ..	(9,647) 11,237	(8,842) 1,796	13,033	12,980	53	971	7·45
	Godavari Left Bank Canal	(7,375) 8,481	(7,270) 1,276	9,757	9,757	..	818	8·5
19	Chankapur Tank—Girna Left Bank Canal	(805) 2,720	(2,575) 2,762	5,482	5,477	5	265	4·83
20	Kadwa River Works. Palkhed Canal ..	(934) 675	(1,124) 833	1,508	1,499	9	12	0·80
	Kadwa River Works. Ojhar-Tambat Canal	(633) 477	(688) 404	881	881	..	7	0·79
	Kadwa River Works. Wadali Canal ..	(382) 312	(599) 510	822	822	..	3	0·36
21	Parsul Tank	(19) 10	(26) 41	51	51	..	..	..
22	Pravara Right Bank Canal	(4,750) 5,879	(4,034) 2,332	8,211	8,210	1	447	5·45
	Pravara Left Bank Canal	(13,026) 15,881	(13,055) 5,236	21,117	21,001	116	637	3·02
23	Bhatodi Tank	(29) 30	(562) 612	642	629	13	..	..
	Central Circle.							
24	Koregaon Tank	..	585	585	585	..	..	..
25	Ashti Tank	600	3,422	4,022	4,011	11	..	..
26	Pathri Tank	5	1,025	1,030	992	38	..	..
27	Jamada Canals	589	1,016	1,605	1,605	..	..	..
28	Hartala Tank	..	13	13	13	..	..	..
29	Mhaswa Tank	117	340	457	454	3	..	..
30	Lower Panjhra River Works	*1,073 301	*163 1,118	*1,236 1,419	2,655	..	424	15·97
31	Krishna Canal	4,091	718	4,809	4,226	583	144	2·99
32	Revari Canal	183	654	837	837	..	..	..
33	Upper Man River Works	70	899	969	966	3	20	2·06
34	Yerla River Irrigation Works	360	2,897	3,257	3,230	27	130	3·99

I-E—*contd.*

Average discharges, cubic feet per second.				Area irrigated per cubic foot per second.				Base to which the duties of water are calculated.	
At Head.		Utilized.		Discharged at Head.		Utilized.		Kharif.	Rabi.
Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
10	11	12	13	14	15	16	17	18	19
				Acres.	Acres.	Acres.	Acres.		
..	..	..	..	..	..	..	..	...	
158	135	158	135	(e) 61	(e) 66	(e) 61	(e) 66	15th February to 14th October.	15th October to 14th February.
88	81	88	81	(e) 84	(e) 81	(e) 84	(e) 81		
31	58	31	58	26	44	26	44	15th June to 14th October.	Do.
22	37	22	37	(m) 42	30	42	30	Do.	Do.
6	11	6	11	105	63	105	63	Do.	Do.
3	8	3	8	127	75	127	75	Do.	Do
(n)	(n)	(n)	(n)	..	..	..	..	Do.	Do.
(d) 84	(d) 67	(d) 71	(d) 57	(e) 57	(e) 60	(e) 67	(e) 71	15th February to 14th October	Do.
(d) 275	(d) 301	(d) 216	(d) 254	(e) 48	(e) 43	(e) 60	(e) 51	Do.	Do.
(j) 1	2	1	2	29	(k) 281	29	(k) 281	15th June to 14th October.	Do.
..	2·91	..	2·91	..	201	..	201	15th February to 14th October.	15th October to 14th February.
3·19	17·72	3·19	17·72	188	223	188	223	Do.	Do.
..	4·97	..	4·97	..	209	..	209	Do.	Do.
30·08	45·24	30·08	45·24	20	22	20	22	15th June to 14th October.	Do.
..	0·13	..	0·13	..	100	..	100	Do.	Do.
0·25	3·57	0·25	3·57	468	95	468	95	Do.	Do.
4·79	1·97	4·79	1·97	287	650	287	650	Do.	Do.
41·07	67·47	41·07	67·47	140	65	140	65	16th February to 15th October.	16th October to 15th February.
2·02	5·14	2·02	5·14	91	127	91	127	Do.	Do
0·56	2·47	0·56	2·47	125	364	125	364	Do.	Do.
3·92	15·46	3·92	15·46	92	187	92	187	Do.	Do.

STATEMENT

No.	Name of work.	Area irrigated: Kharif.	Rabi.	Total.	Flow.	Lift.	Double cropped. Area irrigated.	Percentage of total area.
1	2	3	4	5	6	7	8	9
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*concld.*	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
	UNPRODUCTIVE—*concld.*							
	Central Circle—concld.							
35	Chikhli Canal	312	78	390	382	8	6	1·53
36	Maini Tank	903	1,437	2,340	2,304	36	21	0·89
	Southern Circle.							
37	Gokak Canal, First Section and Storage Works.	6,552	2,147	8,699	8,401	298	..	..
38	Muchkundi Tank	..	13	13	13	..	..	..
39	Dambal Tank	55 *143	.. ..	55 *143	55 *143	..	..	..
40	Medleri Tank	36	6	42	41	1	..	..
41	Madag Tank	238	181	419	419	..	..	..
42	Asundi Tank	..	24 *190	24 *190	21 *190	3	..	..
43	Dharma Canal	451 *5,227	.. ..	451 *5,227	451 *5,227	..	..	..
	Total, Unproductive ..	136,650 *6,443	78,879 *353	‡29 215,529 *6,796	216,978	5,347	12,955	5·83
	Grand Total,	137,098 *7,943	82,968 *667	220,066 *8,610 ‡29	223,258	5,418	13,220	5·78

Note.—The bold figures in brackets represent areas actually irrigated during the respective seasons and the duties have crops are irrigated. To obtain correct duties therefore these crops have to be added to the rabi areas.

Note by the Superintending Engineer, Central Circle :—

As perennial and eight months' crops are irrigated during the rabi season, in order to obtain the figures of duty for the the rabi season are added to areas of rabi in column 4 and the total so obtained is divided by figures of rabi discharges

(*b*) The difference between the discharges "At head" and "utilized" is due to canal water having been let into

(*c*) Low duties are due to scattered nature of irrigation. There is no irrigation in the first few miles of each

(*d*) The difference between the discharge at head and utilized is due to water having been run to waste through

(*e*) The duties on the Godavari and Pravara canals are low, due to higher proportion of perennial crops and also to

(*f*) Duties cannot be worked out as the major portion of the discharge was used for testing the canal at the tail, and as at escapes.

(*g*) The high duties on the Shetphal Tank are due to concentration of irrigation on a small channel.

(*h*) Figures of "utilized" discharge are not available as the quantity let into the Matoba tank could not be accurately

(*i*) The low duties are due to high proportion of perennial crops to the seasonal crops. Besides a large quantity and also for industrial purposes.

(*j*) There is generally no supply in the tanks in the hot weather season. Even during the monsoon and rabi seasons which the channels were in flow has therefore been taken for purposes of calculating average discharge and

(*k*) The high duties on the Bhatodi tank during the rabi season are due to less demand for tank water owing to good

(*l*) This represents area in the basin of Lake Beale given out for cultivation.

(*m*) The low duties are due to scattered nature of irrigation and timely rainfall.

(*n*) There was no demand for water under the parsul tank.

* Area under consolidated assessment.
† 102 cusecs were supplied to Khari Cut Canal and Khari sluices through Bhojwa channel and Bokh feeder for
‡ This represents area indirectly irrigated by underground percolation from the Mutha Left Bank Canal.

I-E—*concld.*

Average discharges, cubic feet per second.				Area irrigated per cubic foot per second.				Base to which the duties of water are calculated.	
At Head.		Utilized.		Discharged at Head.		Utilized.		Kharif.	Rabi.
Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
10	11	12	13	14	15	16	17	18	19
				Acres.	Acres.	Acres.	Acres.		
10·09	5·08	10·09	5·08	31	15	31	15	16th February to 15th October.	16th October to 15th February.
6·80	9·47	6·80	9·47	132	151	132	151	" Do.	Do.
58·91	53·37	58·91	53·37	107·00	83·37	107·00	83·37	15th February to 14th October.	15th September to 14th January or 15th October to 14th February.
..	..	..	..	..	..	..	..	Do.	15th October to 14th February.
1·65	8·06	1·65	8·06	120·60	..	120·60	..	16th January to 15th October.	16th October to 15th January.
2·46	2·96	2·46	2·96	14·64	2·03	14·64	2·03	Do.	Do.
6·36	12·02	6·36	12·02	37·89	15·06	37·89	15·06	Do.	Do.
0·26	4·50	0·26	4·50	..	47·56	..	47·56	Do.	Do.
94·83	43·87	94·83	43·87	59·86	..	59·86	..	Do.	Do.
..	..	..	..	..	..	..	..		
..	..	..	..	..	..	..	..		

been calculated on these figures. In the rabi season in addition to pure rabi crops perennial and eight months'

rabi season in columns 15 and 17 the areas of perennial and eight months' crops given in Statement "G" irrigated in in columns 11 and 13. The figures in columns 15 and 17 thus represent areas actually irrigated per cusec.

Shetphal tank and run to waste through scouring sluices.

distributary and branch of the Mhaswad Canal

scouring sluices.

scattered irrigation and weed trouble which cause heavy loss in transit.

discharge was let down to keep a minimum depth of water for a better draw-off in the distributaries and surplus let-off

measured.

of water was supplied for drinking and domestic purposes to the Poona City and Cantonment and suburbs of Poona

the channels are closed for days together due to rainfall and other causes. The actual number of days on duties.

rainfall and also on account of concentrated irrigation.

irrigation.

STATEMENT I-F.

Statement showing water-rates per acre in force during 1930-31 on Irrigation Works in the Bombay Presidency excluding Sind.

No.	Name of Work.	Irrigation in blocks.	WATER-RATES. Perennial.	Early eight months.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.	Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
	Works for which Capital and Revenue Accounts are kept.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	PRODUCTIVE.											
	Southern Circle.											
1	Gadikeri Tank * ..	..	..	..	..	..	..	..	..			
2	Mavinkop Tank * ..	..	..	..	..	..	..	..	..			
	Central Circle.											
3	Ekruk Tank a^{13} ..	..	A 35 B 17½	8	3	5 (b^5)	7	..	1 (b^6)	Nil.	Nil.	Nil.
4	Shahada Channel a ..	..	a^{14}	7½	2½	5	7½	..	a^{14} 1¼ **2½			
	UNPRODUCTIVE.											
	Northern Circle.											
5	Hathmati Canal a^1 ..	..	(b^4)	..	D 3 E 1	3	6	..	2			
	Khari Cut Canal a^1	..	(b^4)	..	D 7 E ⋮	5	6	..	1 **2			
6	Wangroli Tank a^2 ..	..	(b^4)	6½	D 5 E 2½	4	6	..	1½			
7	Savli Tank a^4 ..	..	(b^4)	8	D 5 E 4	4	6	..	1½			
8	Saiat Tank a^5 ..	..	(b^4)	6½	D 4 E 2½	4	6	..	1½			
9	Tranza Nagrama Tanks. a^3	..	(b^4)	6	D 4 E 2	4	6	..	1			
10	Futelao Tank a^6 ..	..	(b^4)	..	D 4 E 2	a^7 3 a^8 2	Provisional 8	..	a^9 1	Nil.	Nil.	Nil.
	Irrigation Development and Research Circle.											
11	Nira Left Bank Canal. Shetphal Tank (*d*) ..	§22 ¶19	M 45 C 66 B 33	Light 12 Heavy 18	Light 4 Heavy 6	Light 8 Heavy 12 (b^5)	Light 10 Heavy 15	..	(*o*)2			
	Deccan Irrigation Circle.											
12	Nira Right Bank Canal (*d*).	§22 ¶19	M 45 C 66 B 33	Light 12 Heavy 18	Light 4 Heavy 6	Light 8 Heavy 12 (b^5)	Light 10 Heavy 15	..	(*o*) 2			
13	Mhaswad Tank (*c*) Z .	..	A 42 B 21	Light 12 Heavy 18	Light 4 Heavy 6	Light 8 Heavy 12 (b^5)	9	..	(*o*) 2			

STATEMENT I-F--*contd.*

No.	Name of Work.	Irrigation in blocks.	Water-rates. Perennial.	Early eight months.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.	Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
	Works for which Capital and Revenue Accounts are kept— *contd.*	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	UNPRODUCTIVE—*contd.*											
	Deccan Irrigation Circle —contd.											
14	Mutha Canals and Matoba Tank (*d*)—											
	Sugarcane under the Mutha Canals within the Poona City and Suburban Municipal and Cantonment limits or within one mile of those limits.	..	(*i*) 50	Light 12 Heavy 18	Light 4 Heavy 6	Light 8 Heavy 12 (*b*5)	Light 10 Heavy 15	..	(*o*) 2			
	On all remaining land commanded by both the canals.	..	M 45							*Nil.*	*Nil.*	*Nil.*
	Pan gardens ..	..	C 66									
	Perennial crops other than sugarcane and pan gardens.	..	B 33									
	Matoba Tank ..	..	(*g*)									
15	Kasurdi Tank (*b*) ..	..										
16	Shirsuphal Tank (*b*)..	..	(*b*8)	8 for leased area.	3	5 for leased area 6 for non-leased area. (*b*5)	9	..	3 for leased area. 4 for non-leased area.	*Nil.*	*Nil.*	*Nil.*
17	Bhadalvadi Tank (*b*)..	..										
18	Godavari Right Bank Canal (*d*).	§22 ¶19	M 45 C 66	Light 12	Light 4	Light 8	Light 10	..	(*o*) 2			
	Godavari Left Bank Canal (*d*).		B 33	Heavy 18	Heavy 6	Heavy 12 (*b*5)	Heavy 15					
19	Chankapur Tank— Girna Left Bank Canal (*c*).	..	A 42 B 21	Light 12 Heavy 18	Light 4 Heavy 6	Light 8 Heavy 12 (*b*5)		9 ..	(*o*) 2			

STATEMENT I-F—*contd.*

No.	Name of Work.	Water-rates. Irrigation in blocks.	Perennial.	Early eight months.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.	Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
	Works for which Capital and Revenue Accounts are kept— *contd.*	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	UNPRODUCTIVE—*contd.*											
	Deccan Irrigation Circle —concld.											
20	Kadwa River Works (c)—											
	Waghad Tank ..	..	A 42	Light 12	Light 4	Light 8.	9	..	(*o*) 2	*Nil.*	*Nil.*	*Nil.*
	Palkhed Canal ..	..										
	Ojhar-Tambat Canal	..		Heavy 18	Heavy 6	Heavy 12 (*b*[5])						
	Wadali Canal ..	..	B 21									
21	Parsul Tank (*c*) ..	..	X	Light 10 Heavy 15	Light 3 Heavy 4½	Light 7 Heavy 10½ (*b*[5])	9	..	(*o*) 2			
22	Pravara Canals (*d*) ..	§22 ¶19	M 45 C 66 B 32	Light 12 Heavy 18	Light 4 Heavy 6	Light 8 Heavy 12 (*b*[5])	Light 10 Heavy 15	..	(*o*) 2			
23	Bhatodi Tank a[18] ..	..	16	8 13(*b*[7])	3	5 (*b*[6])	8	..	2			
	Central Circle.											
24	Koregaon Tank a[13] ..	..	A 32 B 16	7	3	4 (*b*[5])	6	..	(*b*[6]) 1			
25	Ashti Tank a[13] ..	..	A 32 B 16	7	3	4 (*b*[5])	6	..	(*b*[6]) 1			
26	Pathri Tank a[13] ..	..	A 32 B 16	7	3	4 (*b*[5])	6	..	(*b*[6]) 1			
27	Jamda Canals a[16] ..	..	B 10 A 16	5 a[17]8	2	3	5	..	a[14] 1			
28	Hartala Tank a[16] ..	..	B 9 A 12	5 a[17]7	2	3	4	..	1			
29	Mhasva Tank a[16] ..	..	B 9 A 12	5 a[17]7	2	3	4	..	a[14] 1			
30	Lower Panjhra River Works. a[12]	..	A 30 B 15	8	3	5	7	..	(*b*[6]) 1½ **3			
31	Krishna Canal a[15] ..	..	A 32 B 16	8	3	5 (*b*[5])	8	..	a[14] 1			
32	Revari Canal a[15] ..	..	A 24 B 12	6	2	4 (*b*[5])	6	..	a[14] 1			
33	Upper Man River Works. a[15]	..	A 24 B 12	6	2	4 (*b*[5])	6	..	a[14] 1	*Nil.*	*Nil.*	*Nil.*
34	Yerla River Irrigation Works. a[15]	..	A 26 B 13	6½	2	4½ (*b*[5])	6½	..	a[14] 1			
35	Chikhli Canal a[15] ..	..	A 24 B 12	6	2	4 (*b*[5])	6	..	a[14] 1			
36	Maini Tank a[15] ..	..	A 24 B 12	6	2	4 (*b*[5])	6	..	a[14] 1			

STATEMENT I-F—*concld.*

No.	Name of Work.	Irrigation in blocks.	Water-rates. Perennial.	Early eight months.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.	Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
	Works for which Capital and Revenue Accounts are kept —*concld.*	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	UNPRODUCTIVE —*concld.*											
	Southern Circle.											
37	Gokak Canal, 1st Section and Storage Works. (*u*)	..	(b^1) 27½ (b^2) 20	10	4	6	15	..	1½	*Nil.*	*Nil.*	*Nil.*
38	Muchkundi Tank (*s*)	..	8	4	1	1	4	..	1			
39	Dambal Tank (*w*)	..	(*x*) 14	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
40	Medleri Tank (*w*)	..	(*x*) 14	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
41	Madag Tank (*w*)	..	(*x*) 12	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
42	Asundi Tank (*w*)	..	(*x*) 14	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
43	Dharma Canal a[10]	..	..	..	4½	..	..	..	(*j*) 1 (*k*) 2			

NOTE.—(1) For lift irrigation in the Deccan Irrigation Circle and the Irrigation Development and Research Circle, the Superintending Engineers concerned were authorised in G. R. No. 4771/27, dated 28th January 1931 to charge at their discretion half the flow rates only in cases where the supply was in excess of the demand, and where there was no competition between 'lift irrigation' and 'flow irrigation.' These orders have since been superseded by those in G. R. No. 4771/27, dated 23rd December 1931, which direct that lift from Budkis should not be allowed at all in areas under the flow command of a canal and that in other areas it may be allowed only when the supply of water for irrigation is in excess of the demand at half the flow rates for all crops other than sugarcane for which full rate should be charged.

(2) For lift irrigation half the ordinary rates are charged in other circles.

(3) Double the ordinary rates are charged as penal rates for taking water without permission.

(4) Leakage or percolation rates are the same as ordinary rates.

(5) Water rates for non-irrigational purposes are charged at the rates sanctioned by Government in each case subject to the minimum rates fixed in G. R. No. 851, dated the 7th April 1924.

(6) Water rate of Rs. 2 per acre per watering given to those who are not regular irrigators or holders of rabi leases—*vide* G. Rs. Nos. A-1-1759 and A-1-2525, dated the 5th July 1906 and 3rd March 1916, respectively.

(7) A reserve rate of Rs. 3 per acre as a minimum rate has been sanctioned for lands let out for cultivation in the basin of Lake Beale—*vide* G. R. No. 2484, dated 12th June 1925.

* Lands wholly assessed at consolidated rates.

§ Block rate for blocks with 1:3 proportion of sugarcane calculated as per scale sanctioned in G. R. No. 8670, dated 13th January 1927.

¶ Block rate for blocks with 1:4 proportion of sugarcane calculated as per scale laid down in G. R. No. 1909/27, dated 22nd August 1928.

** For one or more waterings to mature crops for which no applications for irrigation throughout the season are previously submitted.

A—For sugarcane and pan gardens.

B—For perennial crops other than sugarcane.

C—With effect from 15th February 1928, for pan gardens for the whole year. If water is given for part of the year the charge will be on the basis of twice the heavy seasonal rate for the season concerned—*vide* G. R. No. 8670, dated 29th February 1928.

D—For rice.

E—For monsoon crops other than rice.

M—For Sugarcane.

X—For sugarcane and pan gardens double the sum of the seasonal rates for light type crops, for those seasons during which water is given, shall be charged, and for other perennial crops single seasonal rates for light type crops, when water is available.

Z—The Mhaswad Tank will be incorporated in the Nira Right Bank Canal system as soon as irrigation starts at the tail, when the rates sanctioned for the Nira Right Bank Canal will be enforced for all guaranteed irrigation on this tank.

(*b*) Rates sanctioned in G.R. No. 3432/27, dated 26th September 1929 to be in force up to 14th February 1931. Revised rates come into force with effect from 15th February 1931—*vide* G.R. No. 5602/27, dated 9th December 1931.

(c) Rates sanctioned in G.R. No. 9451, dated 5th January 1927 to be in force up to 14th February 1931. Revised water rates come into force with effect from 15th February 1931—*vide* G.R. No. 5602/27, dated 9th December 1931.

(*d*) Rates in force up to 14th February 1931—*vide* G.Rs. Nos. 3952, dated 20th April 1926, 23rd October 1926, 17th March 1927, 13th July 1927, 10th March 1928 and 7th January 1929 and 2486/27, dated 8th February 1930 and G.M. No. 2486/27 I.B., dated 23rd December 1930. Revised water rates come into force with effect from 15th February 1931—*vide* G.R. No. 5602/27, dated 9th December 1931.

(*g*) For sugarcane the short term cane rates as per scale sanctioned in G. R. No. 8670, dated 13th January 1927 (which may be in force on major irrigation works), and for other perennials single heavy seasonal rates will be charged with effect from 15th February 1928.

(*i*) To be in force up to 14th February 1933—*vide* G.Rs. Nos. 9906, dated 31st January 1931 and 5602/27, dated 9th December 1931.

(*j*) From 15th June to 15th October.

(*k*) From 16th October to 14th June.

(*l*) From 15th February to 15th June.

(*m*) From 15th June to 15th October or 15th July to 30th November.

(*n*) From 15th October to 15th February.

(*o*) Sanctioned in G. Rs. Nos. 6573, dated 8th January 1925 and 12th March 1925.

(*s*) In force up to 15th February 1932—*vide* G.R. No. 334, dated 17th June 1926. Revised water rates sanctioned in G.R. No. 5459/27, dated 13th May 1931 come into force with effect from 16th February 1932.

(*u*) From 15th February 1927 to 14th February 1932—*vide* G. R. No. 6243, dated 7th February 1927. With effect from 15th February 1932 revised water rates sanctioned in G. R. No. 466/27, dated 3rd March 1932 come into force.

(*w*) Rates sanctioned for the period of five years ending 31st March 1935—*vide* G. R. No. 6095, dated 22nd October 1924 and G. R. No. 3187/27, dated 22nd August 1929.

(*x*) For sugarcane, betel leaves, etc., for 12 months.

(*y*) For eight months from 15th June to 15th February.

(*z*) For eight months from 15th October to 15th June or 1st August to 31st March.

a Rates sanctioned in G. Rs. Nos. 836, dated 8th October 1923, 836, dated 23rd April 1924, 836, dated 29th July 1924, and 1590/27, dated 19th June 1928, are to be in force up to 14th February 1934.

a[1] Rates sanctioned in G.R. No. 4855, dated 23rd December 1927 are to be in force up to 14th February 1937—*vide* G. R., No. 5956/27, dated 22nd October 1931.

a[2] Rates sanctioned in G. Rs. Nos. 825, dated 30th August 1924 and 825, dated 1st November 1926, are to be in force up to 15th June 1935—*vide* G. R. No. 2861/27 dated 4th July 1929.

a[3] Rates sanctioned in G. Rs. Nos. A-I-1128, dated 13th May 1910 and 679/27, dated 25th November 1927; are to be in force up to 31st July 1933.

a[4] Rates sanctioned in G. Rs. Nos. A-I-1335, dated 14th June 1910, 815, dated 18th February 1925 and 815, dated 13th November 1926, are to be in force up to 15th June 1935 excepting those for kharif rice and single watering which were raised to Rs. 5 and Rs. 1½ respectively with effect from 16th June 1930—*vide* G. R. No. 2894/27, dated 19th June 1929.

a[5] Rates sanctioned in G. Rs. Nos. A-I-309, dated 15th February 1911, 5412, dated 15th December 1926 and 2835/27 dated 4th October 1929 are to be in force up to 15th June 1935.

a[6] Rates sanctioned in G. O. No. A-1-9945, dated 12th October 1917, are to be in force up to 31st March 1935—*vide* G. R. No. 2691/27, dated 29th April 1929.

a[7] For ordinary rabi.

a[8] For restorative crops grown after rice.

a[9] In either kharif or rabi season.

a[10] Rates sanctioned in G. R. No. 293/27 of 9th August 1927 are to be in force up to 31st March 1937—*vide* G. R. No. 293/27, dated 14th February 1931.

a[12] Rates sanctioned in G. R. No. 7736, dated 30th October 1925, are to be in force up to 14th February 1933—*vide* G. R. No. 5602/27, dated 9th December 1931.

a[13] Rates in force up to 15th February 1934—*vide* G. Rs. Nos. 6529, dated 17th January 1925, and 1912/27, dated 27th July 1928 and 9th June 1930.

a[14] For sugarcane and pan gardens double the ordinary rates are charged.

a[15] In force up to 15th February 1933—*vide* G. O. No. A-1-16033, dated 8th December 1919, G. R. No. 3151/27, dated 3rd January 1930 and G. R. No. 5602/27, dated 9th December 1931.

a[16] Rates in force till 31st March 1933—*vide* G. R. No. 5602/27, dated 9th December 1931.

a[17] Water rate for late eight months, *i.e.*, from 15th October to 14th June.

a[18]. These rates sanctioned in G.R. No. 1501/27, dated 30th March 1931 to be in force up to 14th February 1931. With effect from 15th February 1931 revised rates come into force—*vide* G.R. No. 5602/27, dated 9th December 1931.

(b^1) Rate for perennial 12 months.

(b^2) Rate for perennial 8 months.

(b^4) Single seasonal rates are charged—*vide* G. R. No. 3343/27, dated 8th October 1929.

(b^5) For the year 1930-31 as a special case half the rate for the rabi season was charged—*vide* G.R. No. 2353/27, dated 21st January 1931.

(b^6) For sugarcane the single watering rate is Rs. 2 with effects from 15th February 1932—*vide* G.M. No. 6275/27 I.B., dated 23rd February 1932.

(b^7) For late eight months.

(b^8) For sugarcane double the sum of the seasonal rates for those seasons during which water is given shall be charged and for other perennial crops single seasonal rates and, if only one watering is taken, full charge for the season shall be made.

STATEMENT G

STATEMENT

Statement showing Areas and Water-rate Assessments in the Bombay of classification adopted in fixing

No.	Name of Work.	Perennial in blocks.		Perennial outside blocks.					
				Heavy.*		Light.*		Total.	
		Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
	PRODUCTIVE.								
	Southern Circle.								
1	Gadikeri Tank†	..	..	..	..	..	..	..	..
2	Mavinkop Tank †	..	..	..	..	..	..	..	..
	Central Circle.								
3	Ekruk Tank	..	..	..	..	..	..	30	980
4	Shahada Channel	..	..	..	..	..	..	38	625
	Total, Productive ..	..	..	..	..	..	..	68	1,605
	Average rate ..	..	..	..	..	..	..	..	23·60
	UNPRODUCTIVE.								
	Northern Circle.								
5	Hathmati and Khari Cut Canals ..	..	..	..	..	..	..	..	..
6	Wangroli Tank	..	..	..	..	..	..	..	..
7	Savli Tank	..	..	..	..	..	..	..	..
8	Saiat Tank	..	..	..	..	..	..	..	..
9	Tranza Narama Tanks ..	..	..	..	..	..	..	..	..
10	Futelao Tank	..	..	..	..	..	..	..	..
	Irrigation Development and Research Circle.								
11	Nira Left Bank Canal and Shetphal Tank	20,942	4 60,062	4,344	66,001	540	16,196	4,884	82,197
	Deccan Irrigation Circle.								
12	Nira Right Bank Canal ..	662	12,578	255	6,491	38	859	293	7,350
13	Mhaswad Tank	..	..	36	732	21	171	57	903
14	Mutha Canals	..	..	3,540‡	1,05,491	1,953	60,085	5,493	1,65,576
	Matoba Tank	..	..	310	4,974	64	1,113	374	6,087

* The classification of crops into "heavy" and "light" varieties has been introduced only in the

† The area under this tank is wholly under consolidated assessment.

‡ Details of perennials (heavy type) under the Mutha Canals:—

	Area.	Assessment.
	Acres	Rs.
(1) Within the Poona City, Suburban and Cantonment limits or within one mile of these limits	311	10,783
(2) On the remaining land commanded by both the canals	3,222	94,460
(3) Pan gardens wherever situated throughout the canals	7	248
Total ..	3,540	1,05,491

G.

Presidency, excluding Sind, during 1930-1931, according to the system the Scale of Water-rates.

Two Seasonal.						Monsoon—4 Months.					
Heavy.*		Light.*		Total.		Heavy.*		Light.*		Total.	
Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	2	15	..	..	..	..	..	..
..	..	..	..	2	15	..	..	..	..	..	..
..	..	..	..	..	7·50	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	9,830	37,940
..	..	..	..	..	..	..	..	..	..	1,762	8,788
..	..	..	..	..	..	..	..	..	..	2,216	11,504
..	..	..	..	..	..	..	..	..	..	915	3,641
..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..
3,486	58,417	656	8,171	4,142	66,588	7	58	6,000	32,223	6,007	32,281
1,516	19,429	513	2,954	2,029	22,383	116	1,007	2,417	15,172	2,533	16,179
661	6,737	210	1,180	871	7,917	..	..	127	525	127	525
837	10,009	339	2,623	1,176	12,632	14	85	4,235	17,367	4,249	17,452
104	1,290	41	398	145	1,688	..	..	446	1,831	446	1,831

Deccan Irrigation and Irrigation Development and Research Circles.

STATEMENT

No.	Name of Work.	Rabi—4 Months.					
		Heavy.*		Light.*		Total.	
		Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.						
	PRODUCTIVE.						
	Southern Circle.						
1	Gadikeri Tank†	..	..	..	..	..	....
2	Mavinkop Tank†	..	..	..	..	..	....
	Central Circle.						
3	Ekruk Tank	..	..	..	..	2,917	7,393
4	Shahada Channel	..	..	..	..	359	2,227
	Total Productive ..	..	..	..	..	3,276	9,620
	Average rate ..	..	..	..	..	..	2·94
	UNPRODUCTIVE.						
	Northern Circle.						
5	Hathmati & Khari Cut Canals ..	..	..	..	..	1,151	3,373
6	Wangroli Tank	..	..	..	..	189	829
7	Savli Tank	..	..	..	..	..	....
8	Saiat Tank	..	..	..	..	56	226
9	Tranza Narama Tanks	..	..	..	..	..	....
10	Futelao Tank	..	..	..	..	86	295
	Irrigation Development and Research Circle.						
11	Nira Left Bank Canal & Shetphal Tank	842	4,784	22,584	91,344	23,426	96,128
	Deccan Irrigation Circle.						
12	Nira Right Bank Canal	266	1,619	11,455	46,176	11,721	47,795
13	Mhaswad Tank	34	210	1,851	7,549	1,885	7,759
14	Mutha Canals	18	136	356	1,546	374	1,682
	Matoba Tank	86	518	1,893	7,834	1,979	8,352

* The classification of crops into "heavy" and "light" varieties has been introduced only in the Deccan
† The area under this tank is wholly under consolidated assessment.
‡ The column "Miscellaneous" represents areas sanctioned and assessed but not irrigated as well as areas under cannot be properly classified.
§ An area of 29 acres was indirectly irrigated by underground percolation from the Mutha Left Bank Canal and
| Exclusive of 995 acres of mamul bagait area.

G—*contd.*

Hot weather—4 Months.						Miscellaneous ‡		Grand Total.	
Heavy.*		Light.*		Total.					
Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..
..	..	..	..	200	1,400	852	2,941	3,999	12,714
..	..	..	..	66	504	73	176	538‖	3,547
..	..	..	..	266	1,904	925	3,117	4,537	16,261
..	..	..	..	..	7·16	..	3·37	..	3·58
..	..	..	..	124	251	..	..	11,105	41,564
..	..	..	..	..	..	..	..	1,951	9,617
..	..	..	..	..	..	..	..	2,216	11,504
..	..	..	..	..	..	..	..	971	3,867
..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	86	295
5	129	4,710	28,026	4,715	28,155	1,827	16,581	65,943	7,81,992
72	258	373	2,386	445	2,644	1,211	5,074	18,894	1,14,003
..	..	184	1,575	184	1,575	435	2,554	3,559	21,233
82	573	190	1,267	272	1,840	122	461	11,686	1,99,643
..	..	7	36	7	36	..	..	29§ 2,951	61§ 17,994

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penalties for waste of water, etc., and land insufficiently irrigated besides the areas of miscellaneous crops which hence it cannot be classified in respect of different crops. The revenue derived therefrom was Rs. 61.

STATEMENT

No.	Name of Work.	Perennial in blocks.		Perennial outside blocks.					
				Heavy.*		Light.*		Total.	
		Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*contd.*								
	UNPRODUCTIVE—*contd.*								
	Deccan Irrigation Circle—contd.								
15	Kasurdi Tank	..	..	..	..	1	2	1	2
16	Shirsuphal Tank	..	..	12	144	72	377	84	521
17	Bhadalwadi Tank	..	..	39	407	2	8	41	415
18	Godavari Right Bank Canal ..	6,964	1,52,121	162	5,553	438	13,261	600	18,814
	Godavari Left Bank Canal ..	5,964	1,30,033	25	901	254	7,396	279	8,297
19	Chankapur Tank - Girna Left Bank Canal	..	..	309	13,806	54	510	363	14,316
20	Kadwa River Works — Palkhed Canal ..	..	..	138	5,653	34	581	172	6,234
	Kadwa River Works — Ojhar Tambat Canal..	..	..	136	5,953	31	616	167	6,569
	Kadwa River Works — Wadali Canal ..	..	..	93	3,893	21	291	114	4,184
21	Parsul Tank	..	..	3	121	8	96	11	217
22	Pravara Right Bank Canal ..	2,740	59,390	180	2,618	552	16,197	732	18,815
	Pravara Left Bank Canal ..	7,849	1,69,951	4,672	1,11,076	678	20,634	5,350	1,31,710
23	Bhatodi Tank	..	..	..	..	14	109	14	109
	Central Circle.								
24	Koregaon Tank	..	..	..	..	..	..	..	..
25	Ashti Tank	..	..	..	..	..	..	62	1,541
26	Pathri Tank	..	..	..	..	..	..	..	..
27	Jamda Canals	..	..	..	..	..	..	102	1,143
28	Hartala Tank	..	..	..	..	..	..	..	..
29	Mhaswa Tank	..	..	..	..	..	..	..	..
30	Lower Panjhra River Works ..	..	..	..	..	..	..	173	2,746
31	Krishna Canal	..	..	..	..	..	..	1,828	52,944
32	Revari Canal	..	..	..	..	..	..	84	1,527
33	Upper Man River Works ..	..	..	..	..	..	..	16	204
34	Yerla River Irrigation Works ..	..	..	..	..	..	..	52	570
35	Chikhli Canal	..	..	..	..	..	..	32	375
36	Maini Tank	..	..	..	..	..	..	66	261

* The classification of crops into "heavy" and "light" varieties has been introduced only in the Deccan

G—*contd.*

Two Seasonal.						Monsoon—4 months.					
Heavy.*		Light.*		Total.		Heavy.*		Light.*		Total.	
Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
3	11	1	4	4	15	..	..	6	31	6	31
56	435	132	1,060	188	1,495	..	..	230	741	230	741
59	476	19	156	78	632	..	..	88	269	88	269
294	4,399	8	95	302	4,494	33	199	659	2,694	692	2,893
83	1,222	..	..	83	1,222	16	100	94	399	110	499
26	269	1	7	27	276	96	672	319	1,319	415	1,991
708	7,642	38	459	746	8,101	8	67	8	48	16	115
463	4,645	..	..	463	4,645	..	..	4	17	4	17
237	3,079	2	20	239	3,099	25	225	4	16	29	241
4	42	..	..	4	42	..	..	4	11	4	11
56	1,008	15	183	71	1,191	82	510	1,390	5,711	1,472	5,221
74	1,368	18	216	92	1,584	55	334	2,349	10,980	2,404	11,314
..	..	1	4	1	4	..	..	24	73	24	73
..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	463	3,445	..	..	..	..	14	41
..	..	..	..	5	39	..	..	..	..	..	..
..	..	..	..	113	570	..	..	..	..	39	79
..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	1	2
..	..	..	..	69	665	..	..	..	..	4	14
..	..	..	..	1,645	13,481	..	..	..	..	512	1,673
..	..	..	..	95	587	..	..	..	..	16	34
..	..	..	..	20	44	..	..	..	..	45	252
..	..	..	..	112	535	..	..	..	..	227	071
..	..	..	..	37	144	..	..	..	..	281	585
..	..	..	..	34	72	..	..	..	..	846	1,752

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STATEMENT

No.	Name of Work.	Rabi—4 Months.					
		Heavy.*		Light.*		Total.	
		Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*contd.*						
	UNPRODUCTIVE—*contd.*						
	Deccan Irrigation Circle—contd.						
15	Kasurdi Tank	7	22	47	130	54	152
16	Shirsuphal Tank	53	131	596	1,550	649	1,681
17	Bhadalwadi Tank	28	113	1,190	2,980	1,218	3,093
18	Godavari Right Bank Canal ..	99	605	877	3,556	976	4,161
	Godavari Left Bank Canal ..	108	677	836	4,196	944	4,873
19	Chankapar Tank—Girna Left Bank Canal	64	383	2,121	8,467	2,185	8,850
20	Kadwa River Works. Palkhed Canal ..	54	319	152	608	206	927
	Ojhar Tambat Canal ..	18	122	41	164	59	276
	Wadali Canal ..	128	750	118	470	246	1,220
21	Parsul Tank	1	1	10	41	11	42
22	Pravara Right Bank Canal ..	83	502	2,125	8,585	2,208	9,088
	Pravara Left Bank Canal ..	302	1,847	3,243	13,143	3,545	14,990
23	Bhatodi Tank	..	..	599	1,498	599	1,498
	Central Circle.						
24	Koregaon Tank	..	..	..	..	595	1,268
25	Ashti Tank	..	..	..	..	3,347	6,807
26	Pathri Tank	..	..	..	..	1,025	2,124
27	Jamda Canals	..	..	..	..	687	2,861
28	Hartala Tank	..	..	..	..	13	39
29	Mhaswa Tank	..	..	..	..	326	1,028
30	Lower Panjhra River Works ..	..	..	..	..	1,115	6,121
31	Krishna Canal	..	..	..	..	659	1,861
32	Revari Canal	..	..	..	..	638	1,390
33	Upper Man River Works ..	..	..	..	..	888	1,885
34	Yerla River Irrigation Works ..	..	..	..	..	2,862	6,985
35	Chikhli Canal	..	..	..	..	40	165
36	Maini Tank	..	..	..	..	1,394	2,941

* The classification of crops into "heavy" and "light" varieties has been introduced only in the Deccan
† The column "Miscellaneous" represents areas sanctioned and assessed but not irrigated as well as areas under be properly classified.
‡ This represents areas in the basin of Lake Beale let out for cultivation and the assessment charged thereon.
§ Exclusive of 1,236 acres of Mamul Bagait area.
|| Exclusive of Rs. 6,926 on account of enhanced water rates on old works.

G—*contd.*

Hot weather—4 Months.						Miscellaneous†		Grand Total.	
Heavy.*		Light.*		Total.					
Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
..	..	..	..	..	..	..	..	65	200
..	..	8	57	8	57	4	16	1,163	4,511
..	..	6	59	6	59	6	25	1,437	4,493
..	..	1,089	11,238	1,089	11,233	2,410	16,258	13,033	2,09,979
						562‡	2,082‡	562‡	2,082‡
8	113	931	9,689	939	9,802	1,438	8,746	9,757	1,63,472
..	..	279	2,512	279	2,512	2,213	10,985	5,482	38,930
..	..	34	305	34	305	334	2,299	1,509	17,981
..	..	6	58	6	58	182	1,046	881	12,611
..	..	72	665	72	665	122	803	822	10,212
..	..	..	..	..	..	21	112	51	424
2	30	395	4,160	397	4,190	531	3,208	8,211	1,02,103
..	..	906	5,216	906	5,216	971	7,744	21,117	3,42,509
..	..	..	..	..	..	4	14	642	1,698
..	..	..	..	..	..	..	..	585	1,268
..	..	..	..	43	336	93	288	4,022	12,458
..	..	..	..	..	..	..	..	1,030	2,163
..	..	..	..	179	887	285	734	1,605	6,274
..	..	..	..	..	..	..	..	13	39
..	..	..	..	..	..	130	174	457	1,204
..	..	..	..	21	145	37	69	1,419§	9,760‖
..	..	..	..	19	85	146	907	4,809	70,951
..	..	..	..	1	6	3	3	837	3,547
..	..	..	..	..	..	..	..	969	2,385
..	..	..	..	..	..	4	4	3,257	8,765
..	..	..	..	..	..	..	..	390	1,269
..	..	..	..	..	..	..	..	2,340	5,026

Irrigation and Irrigation Development and Research Circles.

penalties for waste of water, etc., and land insufficiently irrigated besides the areas of miscellaneous crops which cannot

These areas cannot be classified in respect of different crops.

STATEMENT

No.	Name of Work.	Perennial in blocks.		Perennial outside blocks.					
				Heavy.*		Light.*		Total.	
		Area.	Assessment.	Area.	Assessment.	Area.	Assessment	Area.	Assessment.
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*concld.*	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
	UNPRODUCTIVE—*concld.*								
	Southern Circle:								
37	Gokak Canal 1st Section and Storage Works	..	..	..	..	..	..	78	1,461
38	Muchkundi Tank	..	..	..	..	..	..	13	100
39	Dambal Tank	..	..	..	..	..	..	9	129
40	Medleri Tank	..	..	..	..	..	..	30	425
41	Madag Tank	..	..	..	..	..	..	13	162
42	Asundi Tank	..	..	..	..	..	..	..	..
43	Dharma Canal	..	..	..	..	..	..	..	..
	Total, Unproductive ..	45,121	9,84,135	14,254	3,33,814	4,775	1,38,502	21,587	5,35,904
	Average rate ..		21·81		23·41		29·00		24·82
	Grand Total ..	45,121	9,84,135	14,254	3,33,814	4,775	1,38,502	21,655	5,37,509
	Average rate ..		21·81		23·41		29·00		24·82

* The classification of crops into "heavy" and "light" varieties has been introduced only in the Deccan

G—*concld.*

Two Seasonal.						Monsoon—4 Months.					
Heavy.*		Light.*		Total.		Heavy.*		Light.*		Total.	
Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
..	..	..	..	2,369	27,645	..	..	..	..	3,465	14,234
..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	12	81
..	..	..	..	..	..	..	..	..	..	6	34
..	..	..	..	13	95	..	..	..	..	229	950
..	..	..	..	24	179	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	451	2,610
8,667	1,20,478	1,994	17,530	15,660	1,35,509	452	3,257	18,404	89,427	39,727	1,77,569
	13·90		8·79		11·85		7·20		4·85		4·46
8,667	1,20,478	1,994	17,530	15,662	1,35,524	452	3,257	18,404	89,427	39,727	1,77,569
	13·90		8·79		11·84		7·20		4·85		4·46

Irrigation and Irrigation Development and Research Circles.

STATEMENT

No.	Name of Work.	Rabi—4 Months.					
		Heavy.*		Light.*		Total.	
		Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*concld.*	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
	UNPRODUCTIVE—*concld.*						
	Southern Circle.						
37	Gokák Canal 1st Section and storage Works	..	..	..	..	‡ 2,123	14,928
38	Muchkundi Tank	..	..	..	..	..	....
39	Dambal Tank	..	..	..	..	..	....
40	Medleri Tank	..	..	..	..	6	26
41	Madag Tank	..	..	..	..	164	784
42	Asundi Tank	..	..	..	..	..	....
43	Dharma Canal	..	..	..	..	..	....
	Total, Unproductive ..	2,191	12,739	50,094	1,99,838	69,839	2,68,503
	Average rate ..		5·81		3·98		3·84
	Grand Total ..	2,191	12,739	50,094	1,99,838	73,115	2,78,123
	Average rate ..		5·81		3·98		3·80

* The classification of crops into "heavy" and "light" varieties has been introduced only in the Deccan

† The column "Miscellaneous" represents areas sanctioned and assessed but not irrigated as well as areas under be properly classified.

‡ An area of 29 acres was indirectly irrigated by underground percolation from the Mutha Left Bank Canal

6—*concld.*

Hot weather—4 Months.						Miscellaneous.†		Grand Total.	
Heavy*.		Light.*		Total.					
Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
..	..	..	..	173	1,423	491	1,204	8,699	60,895
..	..	..	..	..	..	..	..	13	100
..	..	..	..	..	..	34	68	55	278
..	..	..	..	..	..	..	..	42	485
..	..	..	..	..	..	..	..	419	1,991
..	..	..	..	..	..	..	..	24	179
..	..	..	..	..	..	..	..	451	2,610
169	1,103	9,190	67,249	9,919	71,485	13,676	81,459	2,15,529 ‡29	23,04,564 ‡61
	6·52		7·31		7·20		5·95		10·68
169	1,103	9,190	67,249	10,185	73,389	14,601	84,576	2,20,066 ‡29	23,20,825 ‡61
	6·52		7·31		7·20		5·79		10·54

Irrigation and Irrigation Development and Research Circles.

Penalties for waste of water, etc., and land insufficiently irrigated besides the areas of miscellaneous crops which cannot and hence it cannot be classified in respect of different crops. The revenue derived therefrom was Rs. 61.

Administration Report of Irrigation Works in the Deccan and Gujarat for 1930-31 : Review of —

GOVERNMENT OF BOMBAY.

PUBLIC WORKS DEPARTMENT.

Resolution No. P. 22/20177.

Bombay Castle, 5th September 1932

RESOLUTION OF GOVERNMENT.

The irrigation works dealt with in this Report which covers the period 1st April 1930 to 31st March 1931 fall under two categories, viz. (*i*) tanks and canals for which capital and revenue accounts are kept and (*ii*) small tanks, bandharas and drainage channels, for which neither capital nor revenue accounts are kept. The works included under (*i*) are described individually in detail in Section I of the Report. The works mentioned under (*ii*) are small and numerous and a brief comprehensive account of them is given in Section II.

2. The total capital outlay on works for which capital and revenue accounts are kept up to the end of the year under review amounted to Rs. 10,38,06,288.

3. Including an area of 8,610 acres on which a consolidated water and land assessment is levied, the area irrigated was 228,705 acres, as compared with 246,036 acres in the previous year.

4. The gross assessed revenue amounted to Rs. 27,67,176 against Rs. 31,63,392 of the previous year and Rs. 32,78,137, the average of the past three years.

5. The unrealised balance at the close of the year amounted to Rs. 21,95,977. A portion of this amount has since been recovered and steps have been taken to recover the balance outstanding.

6. The working expenses amounted to Rs. 16,20,459, as compared with Rs. 17,13,434 in the previous year.

7. The net revenue (after deducting working expenses) amounted to—

	Rs.
(*i*) On the basis of assessment	.. 11,46,717
(*ii*) On the basis of realisation	.. 10,82,987

as compared with Rs. 14,49,958 and Rs. 13,15,918, respectively, of the previous year.

8. The statement embodied in paragraph 15 of the Report shows the financial results of the more important works in operation.

9. The total area irrigated by works for which neither capital nor revenue accounts are kept was 167,566 acres and the gross revenue obtained was Rs. 7,25,158. The total expenditure incurred on improvements and repairs to these works amounted to Rs. 5,09,246.

By order of the Governor in Council,

T. A. ANDREW,
Deputy Secretary to Government,
Irrigation and Railways.

To

The Finance Department.
The Revenue Department.
The Commissioner in Sind.
The Commissioner, Northern Division.
The Commissioner, Central Division.
The Commissioner, Southern Division.
The Senior Superintendent of Land Records, Central Division.
The Director of Agriculture.
The Director of Information.
The Chief Engineer in Sind.
The Joint Chief Engineer in Sind.
All Superintending Engineers of Circles.
All Collectors in the Presidency proper (except those of Bombay, Thana and Kolaba).
The Accountant General, Bombay.
The Audit Officer, Lloyd Barrage and Canals Construction.
The Executive Engineers in charge of Irrigation Works in the Deccan and Gujarat.
The Secretary to the High Commissioner for India (by letter).

BOMBAY : PRINTED AT THE GOVERNMENT CENTRAL PRESS.

Digitized with financial assistance from the Government of Maharashtra on 22 July, 2017

MAP OF DECCAN & GUJARAT

TO ACCOMPANY THE IRRIGATION ADMINISTRATION REPORT.

1930—31

SCALE 40 MILES TO 1 INCH

REFERENCES

NORTHERN CIRCLE.

Ahmedabad Division.
Kaira and Panchmahals Division.
Surat and Broach Division.

CENTRAL CIRCLE.

Satara Division.
Sholapur Division.
Khandesh Division.

DECCAN IRRIGATION CIRCLE.

Nasik Irrigation Division.
Ahmednagar Division.
Mutha Canals Division.
Malsiras Division.

IRRIGATION DEVT. & RESEARCH CIRCLE.

Nira L. B. Canal Division.

SOUTHERN CIRCLE.

Belgaum Division.
Dharwar Division.
Kanara Division.
Ratnagiri Division.

NORTHERN CIRCLE

AHMEDABAD DIVISION.

AHMEDABAD DISTRICT.

Works in Operation.

1. Hathmati Canal.
2. Sabli Reservoir.
3. Petar Dedhroda Drainage.
4. Viramgam Drainage.
5. Sarangpur Drainage.
6. Nal Lake Feeder.
7. Upper Dam.
8. Gadhada (Botad) Drain.
9. Chakhla Drain.
10. Dholi Canal.
11. Chandola Tank.
12. Vasai Reservoir.
13. Timba Tank.
14. Bhola Feeder.
15. Kankra & Wastrec Drainage.
16. Other Bridges & Outfalls.
17. Dabgarpur Drain.

KAIRA DISTRICT.

Works in Operation.

18. Khet Station.
19. Gotreej Tank.
20. Gadat Tank.
21. Mowal Reservoir.
22. Nadia Reservoir.

KAIRA & PANCH MAHALS DIVISION.

(I) KAIRA.

Works in Operation.	Incomplete Works.
1. Mater Storm.	23. Parej Tank.
2. Treora Tank.	
3. Nagarsa Tank.	
4. Anand Mogri Drain.	
5. Kanjari Tank.	
6. Sajiv Tank.	
7. Limli Tank.	
8. Mangrol Tank.	
9. Phalloo Tank.	
10. Mahmud Tank.	
11. Tumpar Gorad Drain.	

(II) PANCH MAHALS.

12. Wandhra Tank.	29. Kanoloo Tank.
13. Kanjeta Tank.	30. Ghoda Tank.
14. Gorad Tank.	31. Gorad Tank.
15. Ujetada Tank.	32. Rajpura Wandadi Tank.
16. Mohir Tank.	33. Wadia Tulsia Tank.
17. Fatehpur Tank.	34. Dahi River Project.
18. Bhongara Tank.	35. Wyard Bapoi Tank.
19. Sarolee Tank.	
20. Khanderi (Near Asoli) Tank.	
21. Pavia Tank.	

SURAT & BROACH DIVISION.

(I) BROACH.

Works in Operation.

1. Mara Mahendra Jetpore Drainage Channel.	19. Dev Virdool Sadolpur Channel.
2. Nuler-Ghodadra Drainage Channel.	20. Kahol Channel.
3. Mandhora Mohar Drainage Channel.	21. Waghoora Drainage Channel.
4. Amreeshwar Sadkal Drainage Channel.	22. Wadi Tulsia.
5. Sindhan Drainage Channel.	23. Adul Hajat Channel.
6. Kanam Drainage Channel.	24. Asti Channel.
7. Channel from Uber Vela to Kanam Channel near Dabu.	25. Kanoni Embankment Road.
8. Kolwan Sada Drainage Channel.	26. Nimeta Bund.
9. Amreeshwar Drainage Channel, and Sadkal Channel.	27. Protective Bund at Kadadra.
10. Channel from Uber Vela to Kanam Channel near Dabu.	28. do do at Lokhigam.
11. Kolwan Sada Drainage Channel.	29. do do at Hathigam.
12. Amreeshwar Drainage Channel, and Sadkal Channel.	30. do do at Gadchia.
13. Sindhan Drainage Channel.	31. Protective Bund at Kanjeta.
14. Kanam Drainage Channel.	32. do Wadhwa Nada and Kanjeta Village.
15. Amreeshwar Sadkal Drainage Channel.	33. Protective Bund at Dahej.
16. Pakhadan-Ambhet Channel.	34. do at Sutej.
17. Sadkal-Ambet Channel.	35. do at Kim.
18. Jaiva Channel.	36. do at Sora.

(II) SURAT.

Works in Operation.

37. Mortina Channel.	38. Bund between Kapad and Kathora Villages.
39. Wagheej Protective Works.	

CENTRAL CIRCLE.

SATARA DIVISION.

Works in Operation.

1. Krishna Canal.	4. Yerla River Works.
2. Morni Tank.	Nehar Tank.
3. Upper Man River Works.	5. Chikhli Canal.
Phaltan Tank.	6. Bawari Canal.
Incomplete Work.	
7. Shivgaon Tank.	

SHOLAPUR DIVISION.

Works in Operation.

1. Hiroh Tank.	6. Wadshivane Tank.
2. Ashti do.	7. Kondgaon do.
3. Pathri do.	
Incomplete Work.	
4. Hotgi Tank.	7. Mangi Tank.

KHANDESH DIVISION.

Works in Operation.

1. Mukti Tank.	7. Kan River Group.
2. Tarwade do.	8. Jamda R. B. Canal.
3. Tapti River Minor Tributaries.	9. do L. B. do
4. Upper Purjhra River Group.	10. Bhamer Tank.
5. Lower Purjhra River Group.	11. Hartala do
6. Bori River Group.	
Incomplete Work.	
12. Panzumala Tank.	

DECCAN IRRIGATION CIRCLE.

NASIK IRRIGATION DIVISION.

Works in Operation.

1. Waghad Tank.	13. Mosam Group.
2. Chandwar Tank.	14. Godavari do
3. Girnadevla Tank.	15. Darna do
4. Gangapur R. B. Canal.	16. Sutar do
5. Palkhed do	17. Dev do
6. Wadati do	18. Wahalwagi Group.
7. Old Yeotmal Canal.	19. Darna Kasarwadi (Lake Scale)
8. Pimpal Tank.	20. Gadarwat R. B. Canal.
9. Girna Group.	21. do L. B. do
10. Aran Group.	
Works under Construction—Incomplete Work.	
22. Odul Tank.	

AHMEDNAGAR DIVISION.

Works in Operation.

1. Wilson Dam (Lake A. Hill.)	5. Shirsul Tank.
2. Pravara R. B. Canal.	6. Khanapur Tank.
3. Mula R. B. do	7. Pimpalgaon Tank.
4. Lath Canal.	
Works under Construction.	
1. Visapur Tank.	

MUTHA CANALS DIVISION.

Works in Operation.

1. Lake Fee.	5. Kasardi Tank.
2. Left R. B. Canal.	6. Shivajinagar Tank.
3. Mula L. B. do	7. Shaikhwadi Tank.
4. Mutha Tank.	
Incomplete Works.	
8. Khanapur Tank.	9. Varasai Tank.
Works under Construction and Survey in Operation.	
10. Lloyd Dam at Bhatgar (New Lake Waring).	
11. New R. B. Canal (from mile 0 to 47).	

MALSIRAS DIVISION.

Works under Construction and Survey in Operation.

1. New R. B. Canal (from mile 48 to 104).

Work in Operation.

1. Mhaswad Tank.

Incomplete Works.

2. Shenkewadi Tank.	3. Bodhegal Tank.

IRRIGATION DEVT. AND RESEARCH CIRCLE

NIRA LEFT BANK CANAL DIVISION.

Work in Operation.

1. Nira L.B Canal.	2. Ghatghar Tank.

SOUTHERN CIRCLE

BELGAUM DIVISION

Works in Operation.

1. Gokak Canal.—(a) Barrier and Storage Works.
2. Godavari Tank.

DHARWAR DIVISION.

Works in Operation.

1. Dambal Tank.	4. Aroodi Tank.
2. Madhvi do	5. Dharwar and Hangal Canals.
3. Mulag do	6. Kalghatgi Tank.

KANARA DIVISION.

Work in Operation.

1. Mastikoop Tank.

S.M.S.O. Press, 1930.